3

WIRING

3.1 Configuration 3-2
3.2 Servo amplifier 3-4
3.2.1 Commercial power supply 3-6
3.2.2 Power supply capacity 3-7
3.2.3 Motor power input/control power input 3-9
3.2.4 Sequence input/output (CN1) 3-11
3.2.5 Encoder (CN2) 3-14
3.2.6 Loader (CN3) 3-14
3.2.7 Monitor pin (CN4) 3-15
3.3 Servomotor 3-16
3.3.1 Servomotor 3-17
3.3.2 Brake 3-19
3.4 Encoder 3-20
3.5 Connection diagrams 3-25
3.6 Connection examples 3-39

3.1 Configuration

The configuration of FALDIC-W Series is as follows.

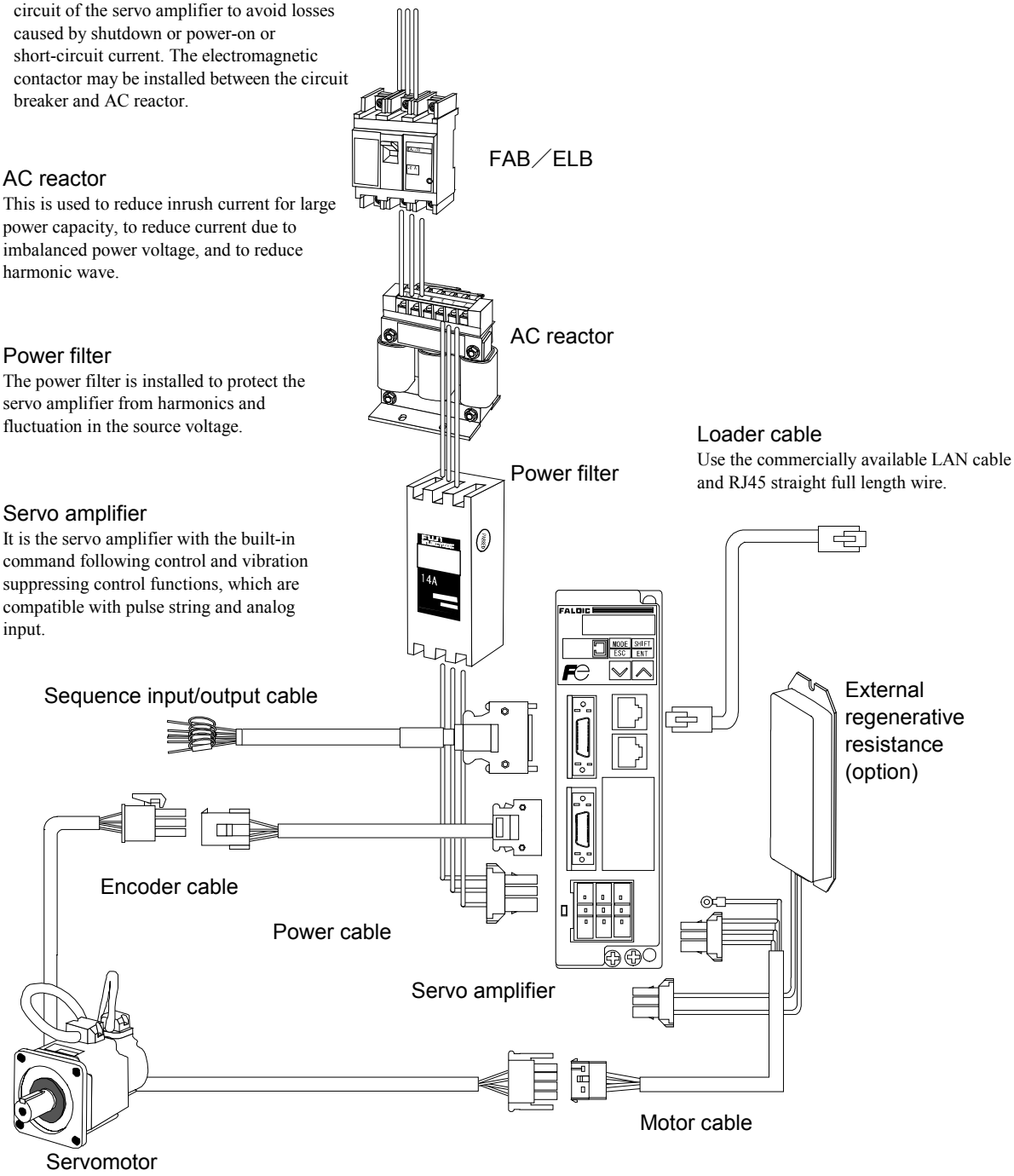
(1) Servomotor (without brake)

FAB/ELB
FAB or ELB is installed in the primary circuit of the servo amplifier to avoid losses caused by shutdown or power-on or short-circuit current. The electromagnetic contactor may be installed between the circuit breaker and AC reactor.

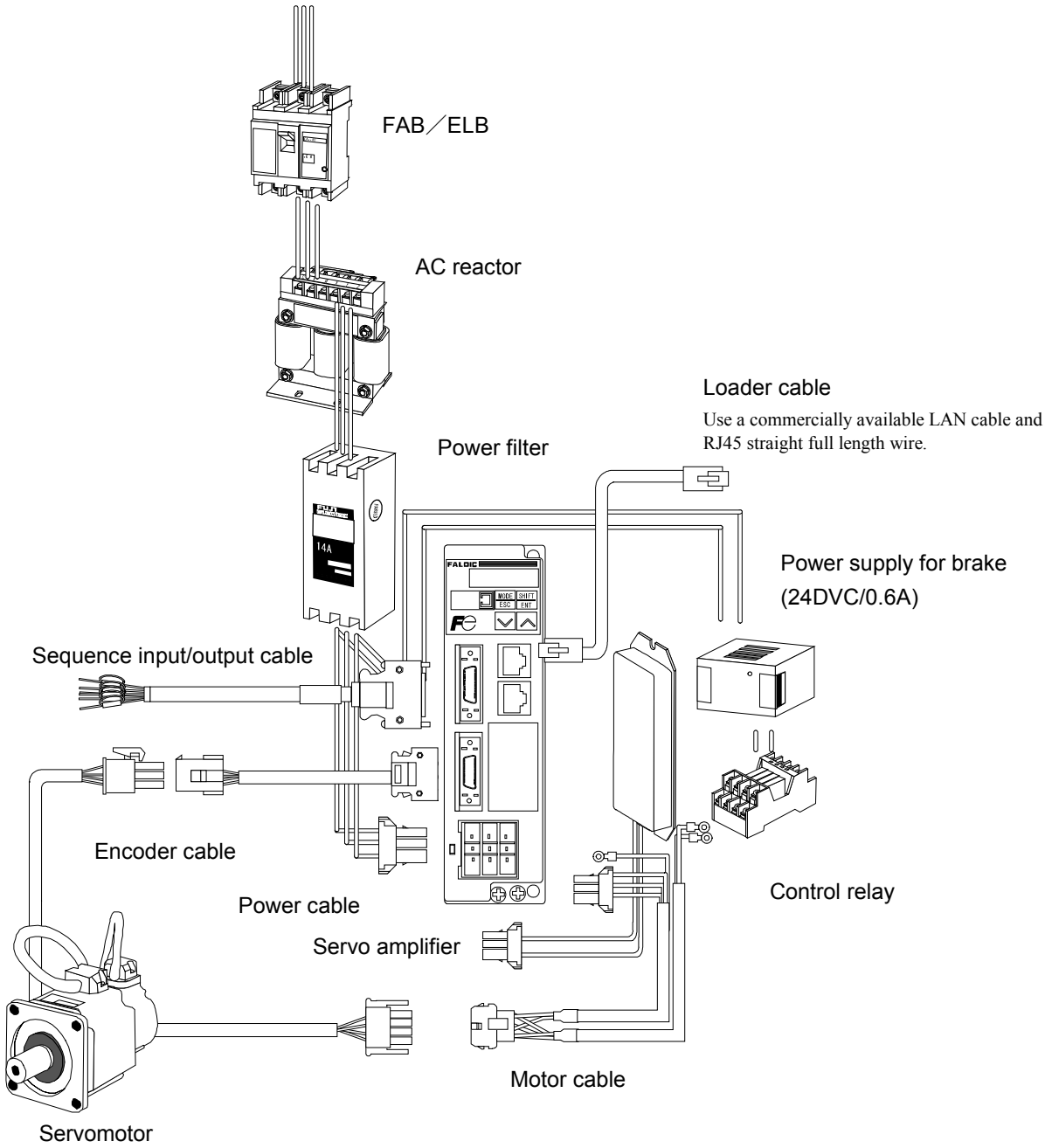
AC reactor
This is used to reduce inrush current for large power capacity, to reduce current due to imbalanced power voltage, and to reduce harmonic wave.

Power filter
The power filter is installed to protect the servo amplifier from harmonics and fluctuation in the source voltage.

Servo amplifier
It is the servo amplifier with the built-in command following control and vibration suppressing control functions, which are compatible with pulse string and analog input.

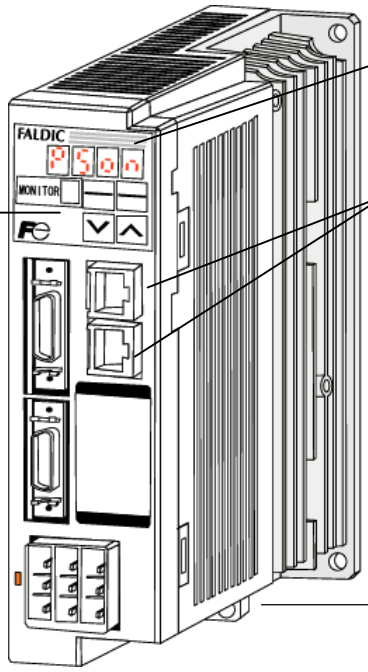


(2) Servomotor (with brake)



3.2 Servo amplifier

■ Configuration 1



Keypad
4 digit 7 segment LED display and 4 operation keys are available.

Type identification

Connector for loader connection
The PC loader is connected.
It can be connected to up to 31 units.

CN1 (connector 1)
Sequence input/output signal, etc. is connected.

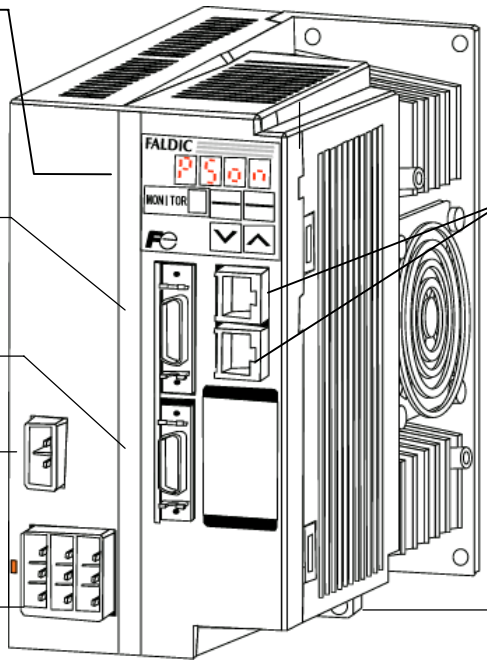
CN2 (connector 2)
The encoder line of the servomotor is connected.

Connector for power
It is connected to the power supply, external regenerative resistor and servomotor.

Grounding terminal
It is connected to the grounding terminal and the earthing terminal of the servomotor.

Connector for control power
Control power is supplied.
The servomotor can be operated with the power supply.

■ Configuration 2



Keypad
4 digit 7 segment display and 4 operation keys are available.

Connector for loader connection
The PC loader is connected.
It can be connected to up to 31 units.

CN1 (connector 1)
Sequence input/output signal, etc. is connected.

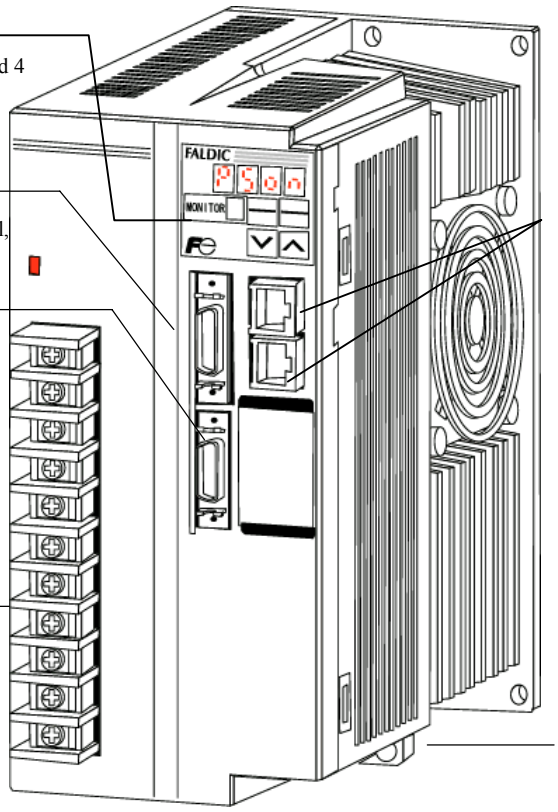
CN2 (connector 2)
The encoder line of the servomotor is connected.

Connector for control power
Control power is supplied.
The servomotor can be operated with the power supply.

Connector for power
It is connected to the power supply, external regenerative resistor and servomotor.

Grounding terminal
It is connected to the grounding terminal and the earthing terminal of the servomotor.

■ Configuration 3


Keypad
4 digit 7 segment display and 4 operation keys are available.
CN1 (connector 1)
Sequence input/output signal, etc. is connected.
CN2 (connector 2)
The encoder line of the servomotor is connected.
Terminal block for power
It is connected to the control power, power supply, external regenerative resistor and servomotor.
Connector for loader connection
The PC loader is connected.
It can be connected to up to 31 units.
Grounding terminal
It is connected to the grounding terminal and the earthing terminal of the servomotor.
FALDIC
MONITOR

Configuration	Rated rotation speed	Applicable motor output	Servo amplifier type
Configuration 1	3000r/min	0.05kW	RYC500D3-VVT2
		0.1kW	RYC101D3-VVT2
		0.2kW	RYC201D3-VVT2
		0.4kW	RYC401D3-VVT2
Configuration 2	3000r/min	0.75kW	RYC751D3-VVT2
	2000r/min	0.5kW	RYC501C3-VVT2
		0.75kW	RYC751C3-VVT2
		1kW	RYC102C3-VVT2
	1500r/min	0.5kW	RYC501B3-VVT2
		0.85kW	RYC851B3-VVT2
Configuration 3	2000r/min	1.5kW	RYC152C3-VVT2
		2kW	RYC202C3-VVT2
	1500r/min	1.3kW	RYC132B3-VVT2

3.2.1 Commercial power supply

Supply the commercial power in chapter 12 to the servo amplifier.
If the commercial power is directly supplied to the servomotor, the servomotor will be damaged.

• GYS type 0.4 kW or less (3000 r/min)

Supply the commercial power of single phase 200V to the servo amplifier. Connect it to L1 and L2 terminals.

Voltage: 200 to 230V, -10% to +10%
Frequency: 50/60 Hz
No. of phases: Single phase (Motor power source: L1, L2)/
Single phase (Control power source: sL1, sL2)

The voltage is reduced from 400V system. (Direct supply may damage the servomotor.)

• GYS type 0.75 kW (3000 r/min)
• GYG type 0.5 kW, 0.75 kW (2000 r/min)
• GYG type 0.5 kW (2000 r/min)

Supply commercial power of single phase 200V or 3 phase 200V to the servo amplifier.
Connect the power to L1 and L2 terminals for single phase and to L1, L2 and L3 terminals for 3 phase.

Voltage: Single phase 200 to 230V, to -10% to +10%, 3 phase 200V to 230V, -15% to +10%
Frequency: 50/60 Hz
No. of phases: Single phase (Motor power source: L1, L2),
3 phase (Motor power source: L1, L2, L3)/
Single phase (Control power source: sL1, sL2)

The voltage is reduced from 400V system. (Direct supply may damage the servomotor.)

• GYG type other than the above

Supply the commercial power of 3 phase 200V to the servo amplifier. Connect the power to L1, L2 and L3 terminals.

Voltage: 3 phase 200V to 230V, -15% to +10%
Frequency: 50/60 Hz
No. of phases: 3 phase (Motor power source: L1, L2, L3)/
Single phase (Control power source: sL1, sL2)

The voltage is reduced from 400V system. (Direct supply may damage the servomotor.)

3.2.2 Power supply capacity

The power supply capacity required for each servo amplifier is as follows. The same power supply capacity applies to the step-up or step-down transformer.

The specified power supply capacity is for the designated cable size and a wiring length of 20m. If the power supply capacity is 500 kVA or more, an AC reactor specified in Chapter 11 should be provided. (Otherwise the contact of the electromagnetic contactor or the like may melt.)

Input power supply	Type of servo amplifier	Applicable motor example	Power supply capacity
Single phase 200 V (3000 r/min)	RYC500D3-VVT2	GYS500DC2-T2A	0.1kVA
	RYC101D3-VVT2	GYS101DC2-T2A	0.2kVA
	RYC201D3-VVT2	GYS201DC2-T2A	0.4kVA
	RYC401D3-VVT2	GYS401DC2-T2A	0.8kVA
Single phase 200 V (2000 r/min)	RYC501C3-VVT2	GYG501CC2-T2E	1kVA
	RYC751C3-VVT2	GYG751CC2-T2A	1.5kVA
Single phase 200 V (1500 r/min)	RYC501B3-VVT2	GYG501BC2-T2A	1kVA

Input power supply	Type of servo amplifier	Applicable motor example	Power supply capacity
3 phase 200 V (3000 r/min)	RYC751D3-VVT2	GYS751DC2-T2A	1.5kVA
3 phase 200 V (2000 r/min)	RYC501C3-VVT2	GYG501CC2-T2E	1kVA
	RYC751C3-VVT2	GYG751CC2-T2E	1.5kVA
	RYC103C3-VVT2	GYG102CC2-T2E	1.9kVA
	RYC152C3-VVT2	GYG152CC2-T2E	2.9kVA
	RYC202C3-VVT2	GYG202CC2-T2E	3.9kVA
3 phase 200 V (1500 r/min)	RYC510B3-VVT2	GYG501BC2-T2E	1kVA
	RYC851B3-VVT2	GYG851BC2-T2E	1.5kVA
	RYC152B3-VVT2	GYG132BC2-T2E	2.9kVA

Action to prevent harmonic wave

The multipurpose inverter and the servo amplifier have been excluded from the “Guideline for prevention of harmonic waves in electric appliances and multipurpose products” from January 2004. The procedures to prevent harmonic waves of multipurpose inverters and servo amplifiers are revised from the previous guideline as follows:

All types of multipurpose inverters and servo amplifiers used by a specific user apply to the “Guideline for prevention of harmonic waves by users who receive power at high voltages or especially high voltages”. All users who are requested to apply the guideline should calculate the equivalent capacity or the harmonic wave runoff current according to the guideline. If the harmonic wave current exceeds the limit specified on the contract demand, appropriate action is required. (Refer to JEM-TR 201 and JEM-TR 225.)

Source: Japan Electrical Manufacturers’ Association

Note) The above description is only valid in Japan.

3.2.3 Motor power input/control power input

To connect the motor power input, control power input, external regenerative resistor and servomotor, use the connector or the terminal block.

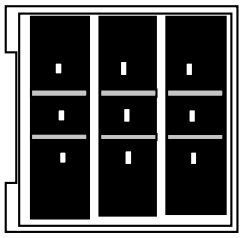
Since connectors do not accompany the servo amplifier, prepare a connector kit or the wiring cable.

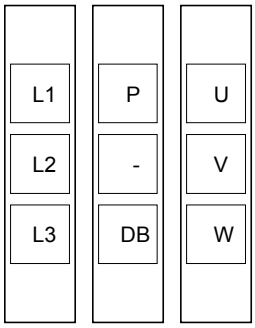
Power wiring is as follows:

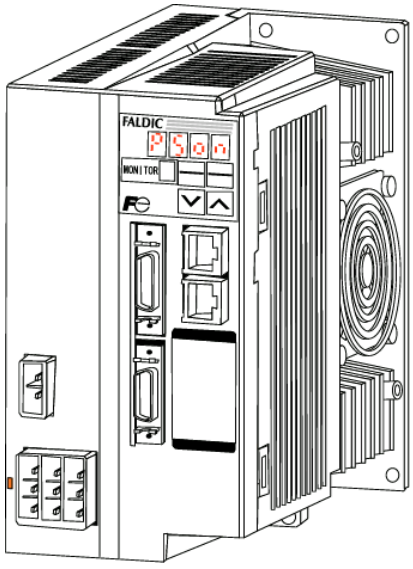
Power wiring	Servo amplifier type	Applicable motor type example
Connector	RYC500D3-VVT2	GYS500DC2-T2A
	RYC101D3-VVT2	GYS101DC2-T2A
	RYC201D3-VVT2	GYS201DC2-T2A
	RYC401D3-VVT2	GYS401DC2-T2A
	RYC751D3-VVT2	GYS751DC2-T2A
	RYC501C3-VVT2	GYG501CC2-T2E
	RYC751C3-VVT2	GYG751CC2-T2E
	RYC103C3-VVT2	GYG102CC2-T2E
Terminal block	RYC152C3-VVT2	GYG152CC2-T2E
	RYC202C3-VVT2	GYG202CC2-T2E
Connector	RYC510B3-VVT2	GYG501BC2-T2E
	RYC851B3-VVT2	GYG851BC2-T2E
Terminal block	RYC152B3-VVT2	GYG132BC2-T2E

■ Connector

• Connector for motor power







Cable compatible connector (Tyco Electronics AMP)

Receptacle housing : 1-178128-3 (L1, L2, L3)

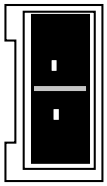
1-178128-3 (P, DB)

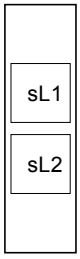
2-178128-3 (U, V, W)

Receptacle contact : 1-175218-5 (Common) * Loose type

1-175196-5 (Common) * Chain type

• Connector for control power





Cable compatible connector (Tyco Electronics AMP)

Receptacle housing : 1-178128-2 (sL1, sL2)

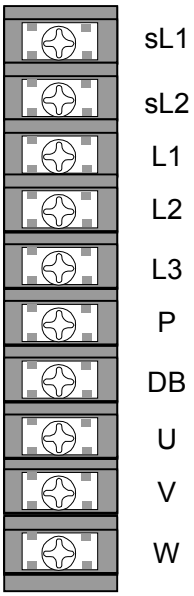
Receptacle contact : 1-175218-5 (Common) * Loose type

1-175196-5 (Common) * Chain type

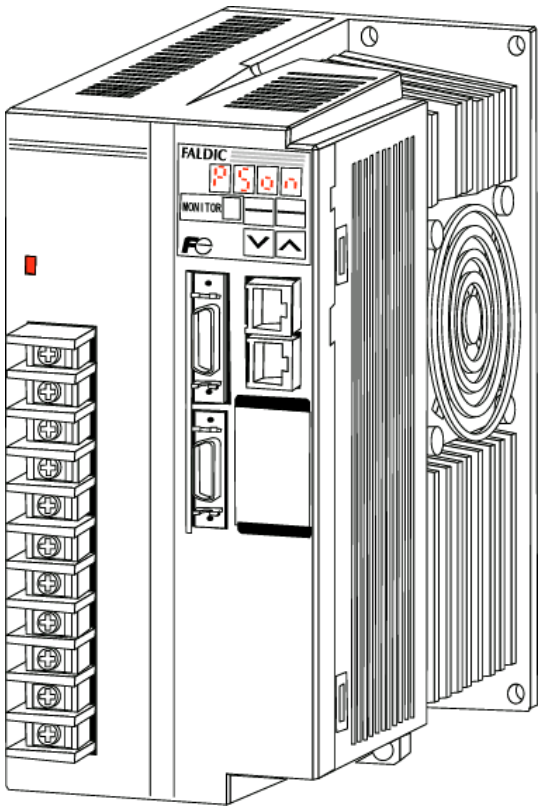
Manual tool (standard type): 919802-1

3 WIRING

■ Terminal block

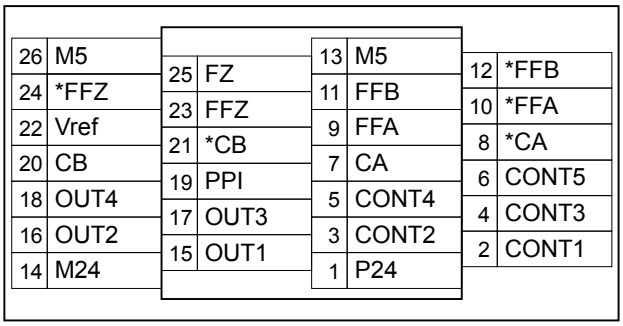


Screw size : M4



3.2.4 Sequence input/output (CN1)

Connect the signal cable of a host controller to connector 1 (CN1) of the servo amplifier.



Compatible connector on cable side (By Sumitomo 3M)

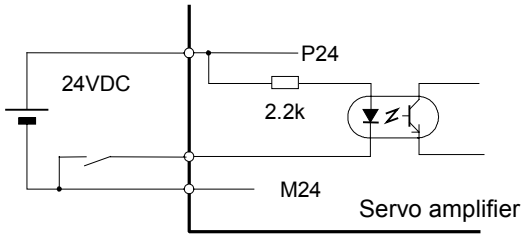
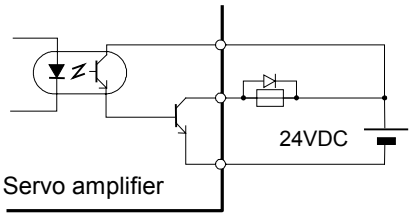
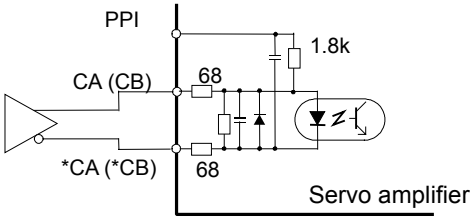
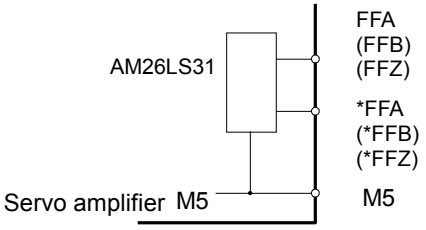
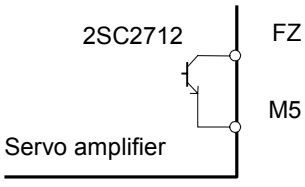
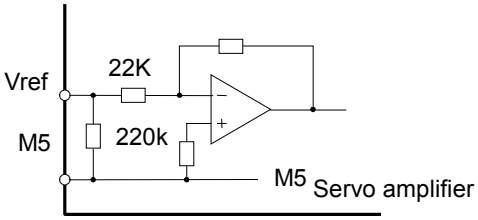
Soldered plug : 10126-3000V

Shell kit : 10326-52A0-008

Terminal symbol	Pin No.	Name	Function and meaning
P24 M24	1 14	Power supply for sequence input/output	Power supply input for sequence input/output signals (+24VDC, 0.3A)
CONT1 CONT2 CONT3 CONT4 CONT5	2 3 4 5 6	Sequence input	Sequence input signals. The following signals are allocated by the factory settings. (+24VDC, 10 mA) CONT 1: Operation command (RUN) CONT 2: Reset (RST) CONT 3: (Not specified) CONT 4: (Not specified) CONT 5: (Not specified)
OUT1 OUT2 OUT3 OUT4	15 16 17 18	Sequence output	Sequence output signals. The following signals are allocated by the factory settings. (Max. +30VDC / 50mA) OUT 1: Alarm detection, a-contact OUT 2: (Not specified) RDY: Active when ready to turn PSET: Active upon completion of positioning
PPI CA *CA CB *CB	19 7 8 20 21	Pulse string input	PPI: Power supply input for open collector (24 VDC +5%/-5%) CA, *CA, CB, *CB (max. input frequency: 1 MHz) CA, CB (max. input frequency: 200 kHz) The pulse string form can be chosen from command pulse and sign, forward/reverse rotation pulse, and two signals having 90-degree phase difference.
FFA *FFA FFB *FFB FFZ *FFZ FZ M5	9 10 11 12 23 24 25 26	Frequency dividing output	Frequency dividing output terminals. Two signals having 90-degree phase difference in proportion to the rotation of the servomotor are output. (Differential output) The FZ terminal is an open-collector output. (Max. +30VDC, 50mA) M5: Reference potential
Vref	22	Analog input	Input terminal of analog voltage. The speed command voltage for speed control and the torque command voltage for torque control are input. The standard potential is M5 terminal.

* Terminal M5 is not connected to terminal M24.

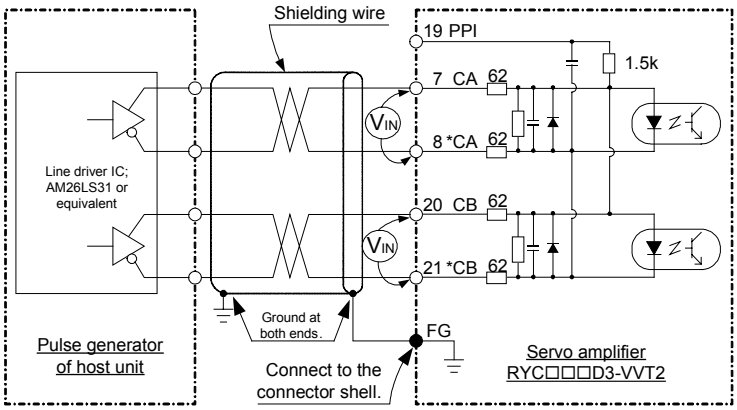
■ Interface circuit diagram

Signal name	Circuit
Sequence input Interface specification 24VDC/10mA (per point)	
Sequence output Interface specification 30VDC/50mA (max)	
Pulse string input Interface specification Differential input (line receiver)	
Pulse string output Interface specification Differential output (line driver)	
Pulse string output (Open collector) Interface specification 30VDC/50mA (max)	
Analog input Interface specification Input impedance 20kΩ	

■ Wiring example of pulse string input

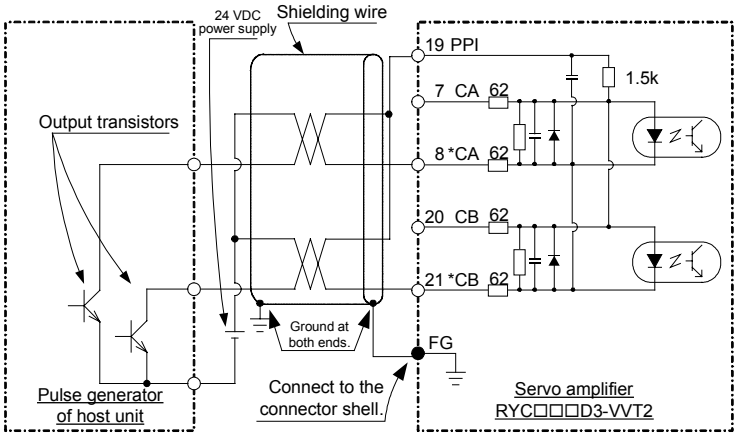
The pulse train input can be a 12 VDC input. In this case, the wiring method varies. Refer to the drawing in item (3) below.

① Differential output devices



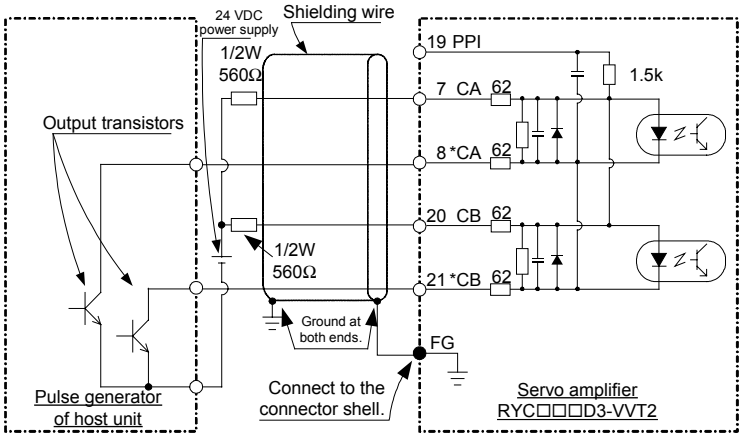
V_{IN}: The voltage amplitude between CA and *CA (between CB and *CB) must be between 2.8 and 3.7V.
(The servo amplifier may not accept the input pulse in other than the specified range.)

② Open collector output devices (24 VDC input)



24 VDC power supply: Contain the source voltage within the 24 VDC ±5% range. This circuit consumes a maximum 40 mA current. Prepare a power supply having a sufficient margin.

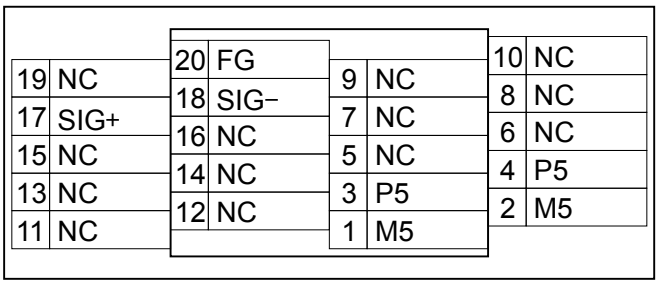
③ Open collector output devices (12 VDC input)



12 VDC power supply: Contain the source voltage within the 12 VDC ±5% range. This circuit consumes a maximum 40 mA current. Prepare a power supply having a sufficient margin.

3.2.5 Encoder (CN2)

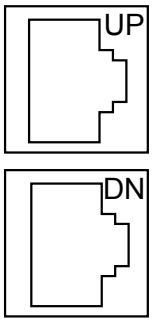
Connect the encoder signal of the servomotor to connector 2 (CN2) of the servo amplifier.



Cable compatible connector (by Sumitomo 3M)
Solder plug : 10120-3000V
Shell kit : 10320-52A0-008

3.2.6 Loader (CN3)

Connect the PC to connector 3 (CN3) of the servo amplifier.
Use the signal converter and the commercially available LAN cable (CAT.5 straight full length wire) for connection. 31 servo amplifiers maximum can be connected.



UP Port

1	P5 (output)
2	M5
3	TXD
4	*RXD
5	RXD
6	*TXD
7	M5
8	P5 (output)

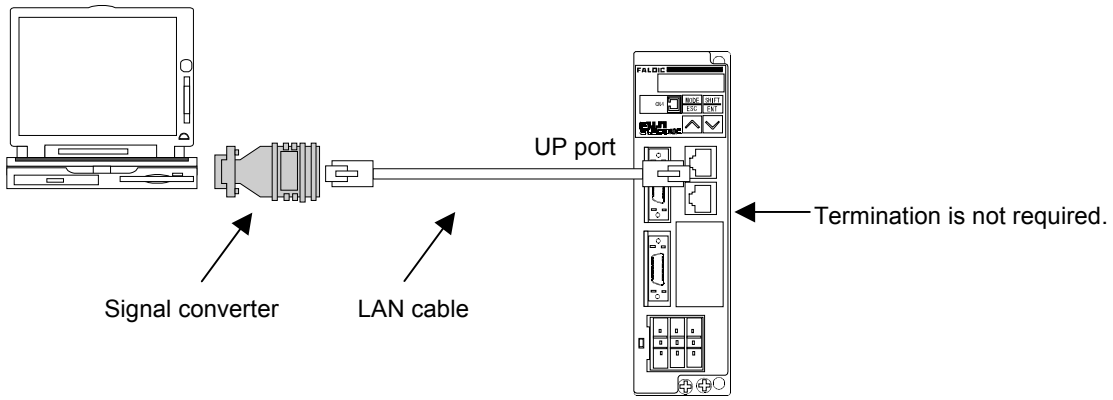
DN Port

1	NC
2	M5
3	TXD
4	*RXD
5	RXD
6	*TXD
7	M5
8	NC

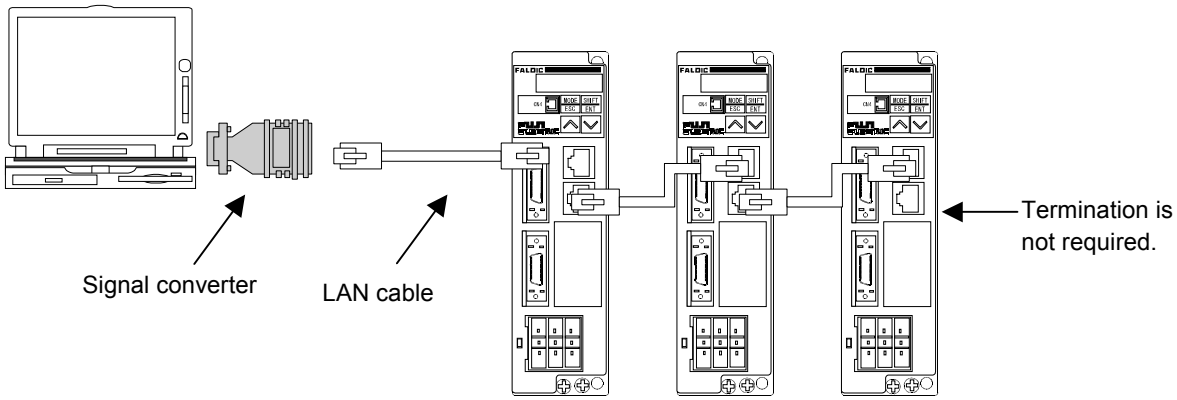
Cable compatible connector
(commercially available product)
RJ-45

Connect the PC to the DN port (lower) and the UP port of the next servo amplifier between the UP port (upper) and the servo amplifier. Final termination is not required.

■ For one servo amplifier



■ For connection to multiple servo amplifiers



3.2.7 Monitor pin (CN4)

Connect the measuring instrument to connector 4 (CN4) of the servo amplifier.

This monitor pin is not required for operation of the servo amplifier and is used for measurement of the servomotor speed waveform and the torque waveform.

CN4 is at the keypad.

Monitor

3	M5	4	M5
1	MON1	2	MON2

Cable compatible connector (by MOLEX)

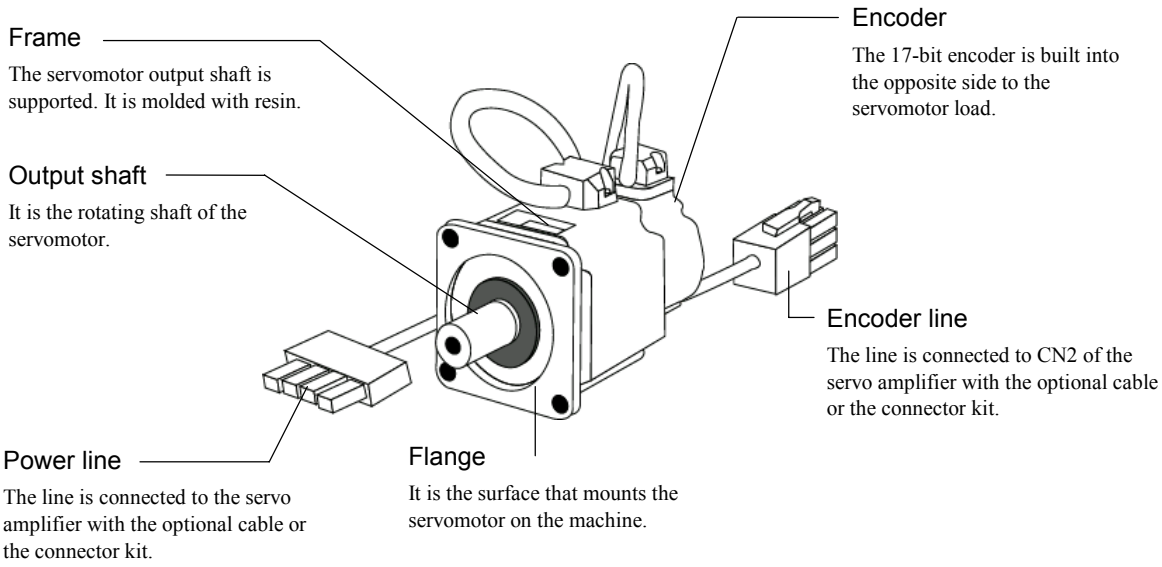
Solder plug : 10126-3000V

The output of MON1 and MON2 terminals can be set with the standard parameters. The standard potential is M5 terminal.

3.3 Servomotor

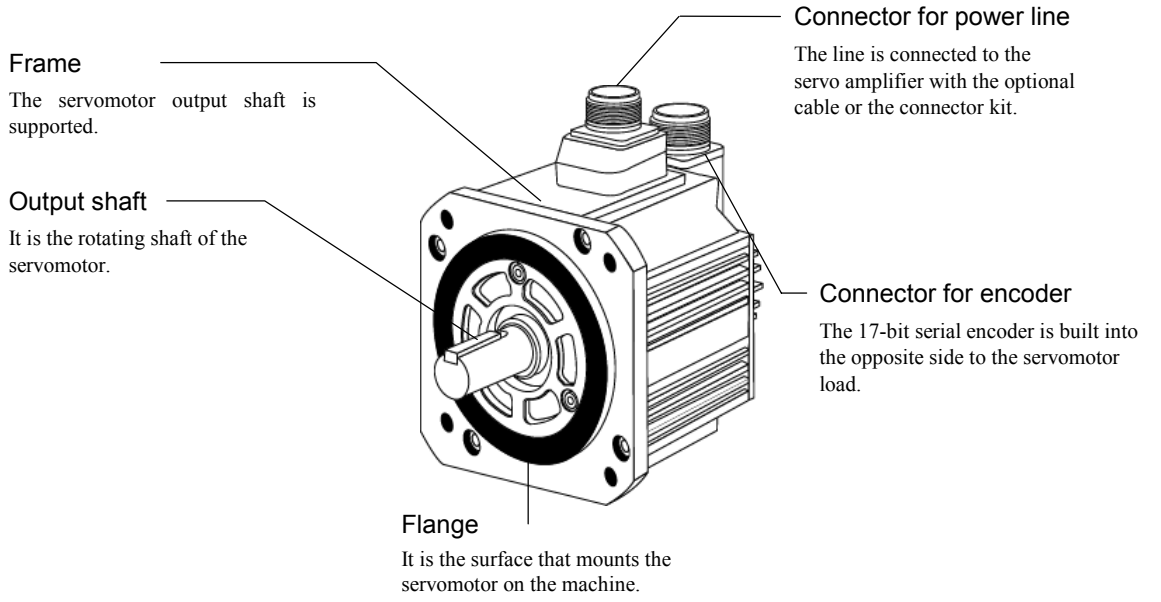
■ GYS type 3000 r/min series

The encoder and the power line have lead wires (0.3 m) with connectors.
The protection grade is IP67 except for the shaft thru-hole and the connector.


Frame
The servomotor output shaft is supported. It is molded with resin.
Output shaft
It is the rotating shaft of the servomotor.
Power line
The line is connected to the servo amplifier with the optional cable or the connector kit.
Flange
It is the surface that mounts the servomotor on the machine.
Encoder
The 17-bit encoder is built into the opposite side to the servomotor load.
Encoder line
The line is connected to CN2 of the servo amplifier with the optional cable or the connector kit.

■ GYG type 2000 and 1500 r/min series

Both the encoder and the power line are connected with canon connectors.
The protection grade is IP67 except for the shaft thru-hole.


Frame
The servomotor output shaft is supported.
Output shaft
It is the rotating shaft of the servomotor.
Flange
It is the surface that mounts the servomotor on the machine.
Connector for power line
The line is connected to the servo amplifier with the optional cable or the connector kit.
Connector for encoder
The 17-bit serial encoder is built into the opposite side to the servomotor load.

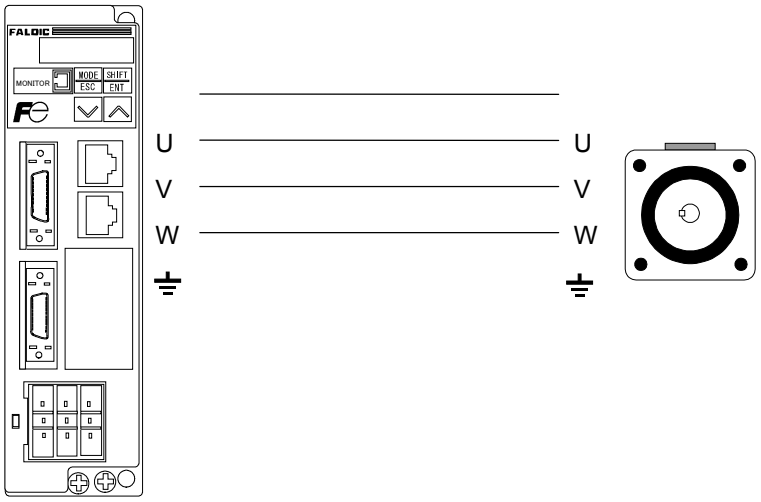
* The appearance varies depending on the motor capacity.

3.3.1 Servomotor

Connect the power cable of the servomotor to the U, V and W terminals of the servo amplifier while identifying the symbols.
Do not supply commercial power directly to the servomotor. Otherwise, the motor may be burned.

⚠ CAUTION	**Do not supply commercial power to the servomotor. Otherwise, the motor may be burned.**

The direction of rotation of the servomotor cannot be changed by changing the sequence of the servomotor terminals. Change the parameter 4 setting to achieve this.

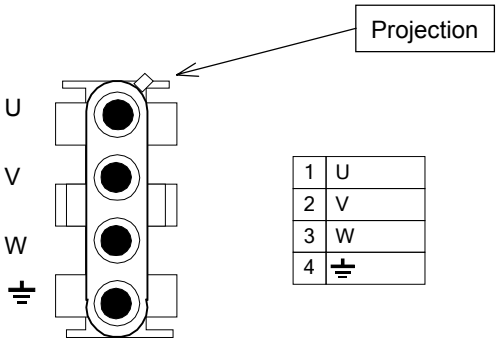


The wiring length between the servo amplifier and servomotor should be within 50 m long.
It is not permitted to perform ON/OFF of the wiring between the servo amplifier and servomotor using magnetic contactors. It is not permitted to turning ON/OFF multiple servomotors with a single servo amplifier.
Furthermore, it is not permitted to connect the following equipment along the wiring between the servo amplifier and servomotor:

• Phase advancing capacitor • Various reactors • Noise filter • Surge absorber

■ GYS type 3000 r/min series

• Without brake



1	U
2	V
3	W
4	⏚

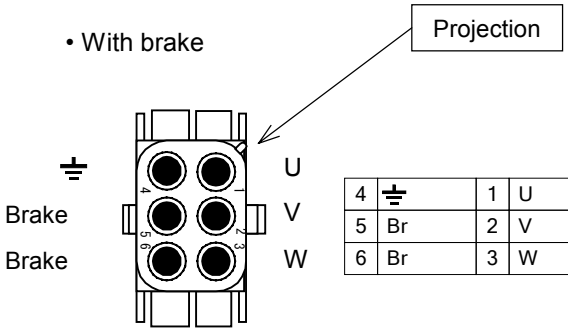
Motor power cable

(Viewed from contact inserting side)

1 cap housing
350780-1 type (Japan AMP)

4 contactors (socket)
350689-3 type (Japan AMP)

• With brake



4	⏚	1	U
5	Br	2	V
6	Br	3	W

Motor power cable

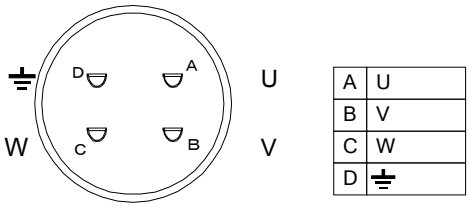
(Viewed from contact inserting side)

1 cap housing
350781-1 type (Japan AMP)

6 contactors (socket)
350689-3 type (Japan AMP)

■ GYG type 2000 and 1500 r/min series

• Without brake



A	U
B	V
C	W
D	⏚

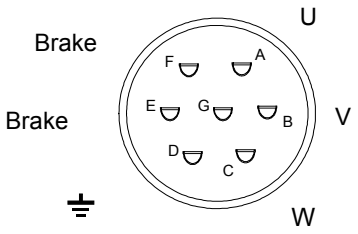
Motor power wiring

(Figure viewed from the plug wiring)

Connector type (L type plug)
MS3108B18-10S type (DDK)

Cable clamp
MS3057-10A type type (DDK)

• With brake



A	U
B	V
C	VV
D	⏚
E	Br
F	Br
G	-

Motor power wiring

(Figure viewed from the plug wiring).

Note) G pin is vacant.

Connector type (L type plug)
MS3108B20-15P type (DDK)

Cable clamp
MS3057-12A type (DDK)

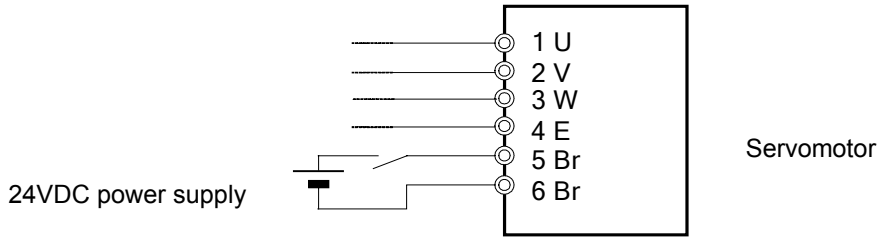
Refer to chapter 2 for straight plug and IP67 compatible connector.

3.3.2 Brake

The built-in motor brake is operated with the 24VDC power.

When 24VDC is applied, the brake is released. When the power is shut off, the brake is operated. The brake operation current is 0.6A or less. It is not directly operated with the sequence output signal of the servo amplifier. The brake power supply has no polarity.

Prepare the relay for rated current of 1A or more. The SSR output has polarity.



Relay (separate type)

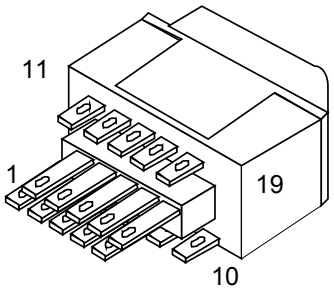
Separately prepare the 24VDC power source for the sequence from the 24VDC power source for the brake.

3.4 Encoder

The 17-bit encoder is built into the opposite side to the servomotor load.
The encoder wire is connected to connector 2 (CN2) of the servo amplifier.
The encoder does not accompany connectors for wiring.
The optional cable with connectors at both ends and the connector kit are available.
The maximum length of the encoder is 50 m and it is restricted by the wiring cable.

■ All GYS models

Wiring on servo amplifier side



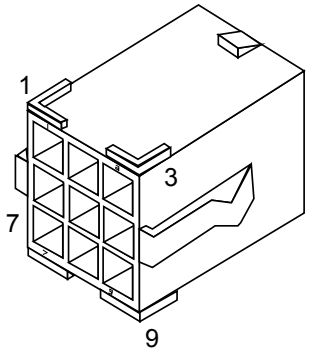
19 NC		20 FG	9 NC		10 NC
17 SIG+		18 SIG-	7 NC		8 NC
15 NC		16 NC	5 NC		6 NC
13 NC		14 NC	3 P5		4 P5
11 NC		12 NC	1 M5		2 M5

Cable compatible connector
(figure viewed
from connector wiring)

Solder plug : 10120-3000V
Shell kit : 10320-52A-008

* By Sumitomo 3M

Wiring on servomotor side



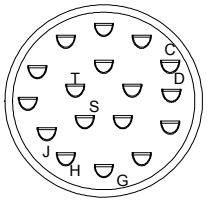
1 NC	2 NC	3 FG
4 SIG+	5 SIG-	6 NC
7 P5	8 M5	9 NC

Cable compatible connector
(figure viewed
from terminal insertion)

Cap housing : 172161-1
Terminal socket :
Chain type 170361-1
Loose type 170365-1
* By Tyco Electronics AMP

Dedicated crimp tool (manual)
755330-1
Dedicated pin terminal pulling tool
189727-1

■ All GYG models



H	P5
G	M5
C	+SIG
D	-SIG
J	SHIELD

Cable compatible connector
(figure viewed from wiring)

Connector type (L shaped plug)
Type: MS3108B20-29S
(DDK)

Cable clamp
Type: MS3057-12A (DDK)

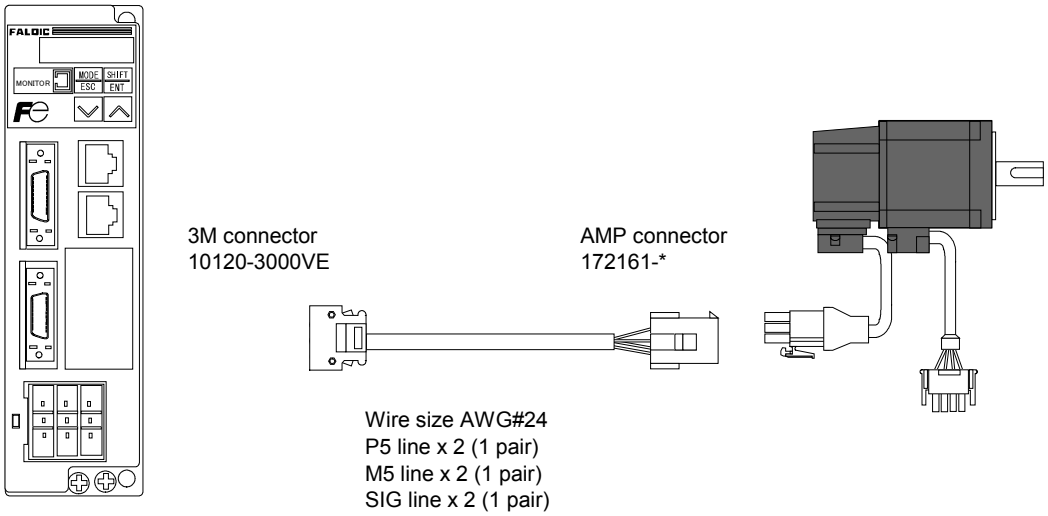
• Wiring cable

Use the following cables if the optional encoder cable is not used.
It is a normal twisted pair total shielded wire.
If the motor and the cable are not moving, it is not necessary to use a flexible cable.

■ Cross-link polyethylene insulated, vinyl sheath cable for robot travel (DAIDEN Co., Ltd.)

RMCV-SB-A (UL2464)　AWG#24/3P (twisted-pair cable)

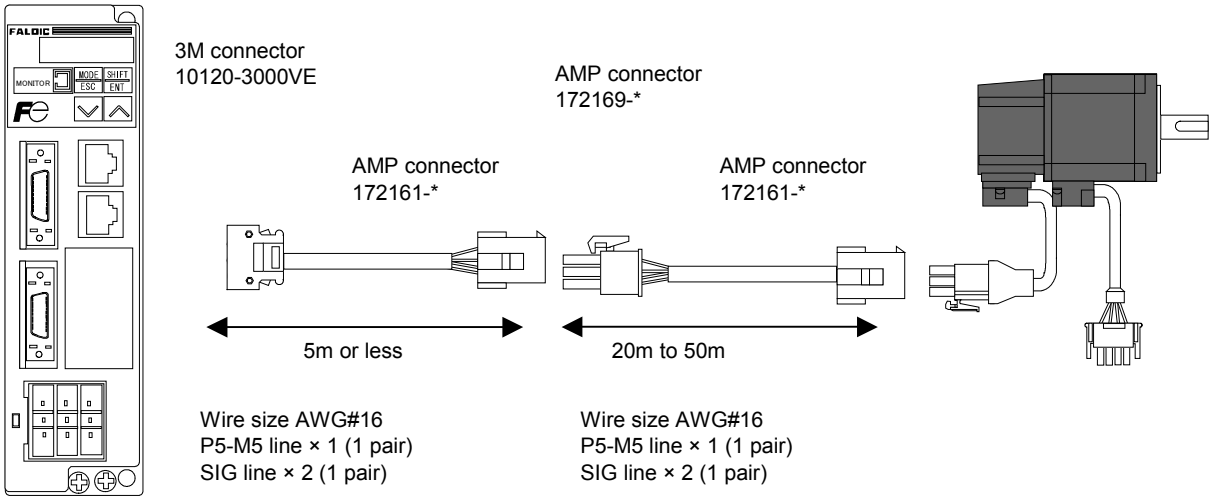
(Cable length: within 20m)



■ Cross-link polyethylene insulated, vinyl sheath cable for robot travel (DAIDEN Co., Ltd.)

RMCV-SB-A (UL2464) AWG#16/2P (twisted-pair cable)

(Wire length exceeds 20m and is 50m or less.)



• Cable size

See the following table for conversion between AWG and mm sizes.

Gauge		SI unit		Inch unit	
A.W.G	mm^2 conversion	Diameter [mm]	Sectional area [mm^2]	Diameter [mil]	Sectional area [CM]
16	1.25	1.291	1.309	50.82	2583
17		1.150	1.037	45.26	2048
18		1.024	0.8226	40.30	1624
19		0.9116	0.6529	35.89	1288
20		0.8118	0.5174	31.69	1021
21		0.7229	0.4105	28.46	810.0
22		0.6438	0.3256	25.35	642.6
23		0.5733	0.2581	22.57	509.4
24		0.5106	0.2047	20.10	404.0
25		0.4545	0.1623	17.90	320.4
26		0.4094	0.1288	15.94	254.1
27		0.3606	0.1021	14.20	201.6
28		0.3211	0.08097	12.64	159.8
29		0.2859	0.06425	11.26	126.8
30		0.2546	0.05097	10.03	100.6

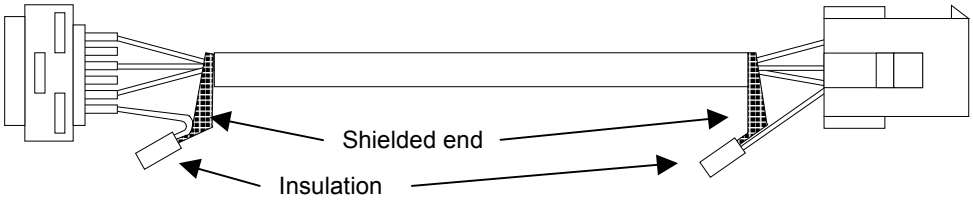
■ Preparation method of encoder cable

1) Do not provide a relay terminal block between the servo amplifier and the servomotor.

2) Use a shielded wire.

3) Connect the end of the shielded wire to the connector pin.

For transmission between the servo amplifier and the encoder, high speed serial communication is used. To obtain reliability of the serial communication, it is important to shield the cable (connectors at both ends). Perform shielding according to the procedure below:



4) Allow for voltage drop of the cable.

The encoder consumes a current of approx. 200 mA.

When the wire resistance of the encoder is 1.59Ω or less, the encoder can be operated.

Considering the voltage drop of the cable, the relationship of the wire length (L) between the servo amplifier and the servomotor for the conductor resistance is as shown in formula ①.

$$\text{Wire length (L [m])} \leq \frac{1.59\ [\Omega]}{\text{Conductor resistance [}\Omega\text{/km]}} \times 1000[\text{m}] \times \frac{1}{2^*} \cdots \text{Formula ①}$$

* The reason for the voltage drop is two wires of P5 and M5.

<Example>

When the wire resistance of AWG24 is 85.9 Ω/km (*1), with formula ①

$$\text{Wire length (L [m])} \leq \frac{1.59\ [\Omega]}{85.9\ [\Omega/\text{km}]} \times 1000[\text{m}] \times \frac{1}{2^*} = 9.25[\text{m}]$$

Therefore, Wire length (L [m]) ≤ 9.25 [m]

When the distance between the amplifier and the motor is 9.25 m or less, the encoder can be used. Determine the encoder wire length after checking the maximum conductor resistance (Ω/m) with your cable.

*1: For bridging wire AWG24 by Hitachi Cable, the maximum conductor resistance is 0.0859Ω/m.

3.5 Connection diagrams

Connection diagrams of the servo amplifier are shown here.

(1) 3000 r/min series 0.05 kW - 0.4 kW

(2) 3000 r/min series 0.75 kW

(3) 2000 r/min series 0.5 kW - 0.75 kW

(4) 2000 r/min series 1 kW - 2 kW

(5) 1500 r/min series 0.5 kW

(6) 1500 r/min series 0.85 kW - 1.3 kW

• The servomotor shows the wiring diagram of the motor with a brake.
The servomotor without a brake does not have No. 5 and 6 terminals or E, F and G terminals.

• Refer to Section 3.6 for the connection of other devices.

• The sequence input/output terminal initial values of the servo amplifier are as follows:
Settings before shipment from factory

CONT1: Servo ON	OUT1 terminal: Servo ready
CONT2: Alarm reset	OUT2 terminal: Positioning end
CONT3: (Not specified)	OUT3 terminal: Servo alarm (b contact)
CONT4: (Not specified)	OUT4 terminal: (Not specified)
CONT5: (Not specified)	

• Connector 4 (CN4) is not required for operation of the servomotor.
It is used for measurement of the servomotor speed waveform and the torque waveform using measuring instruments.

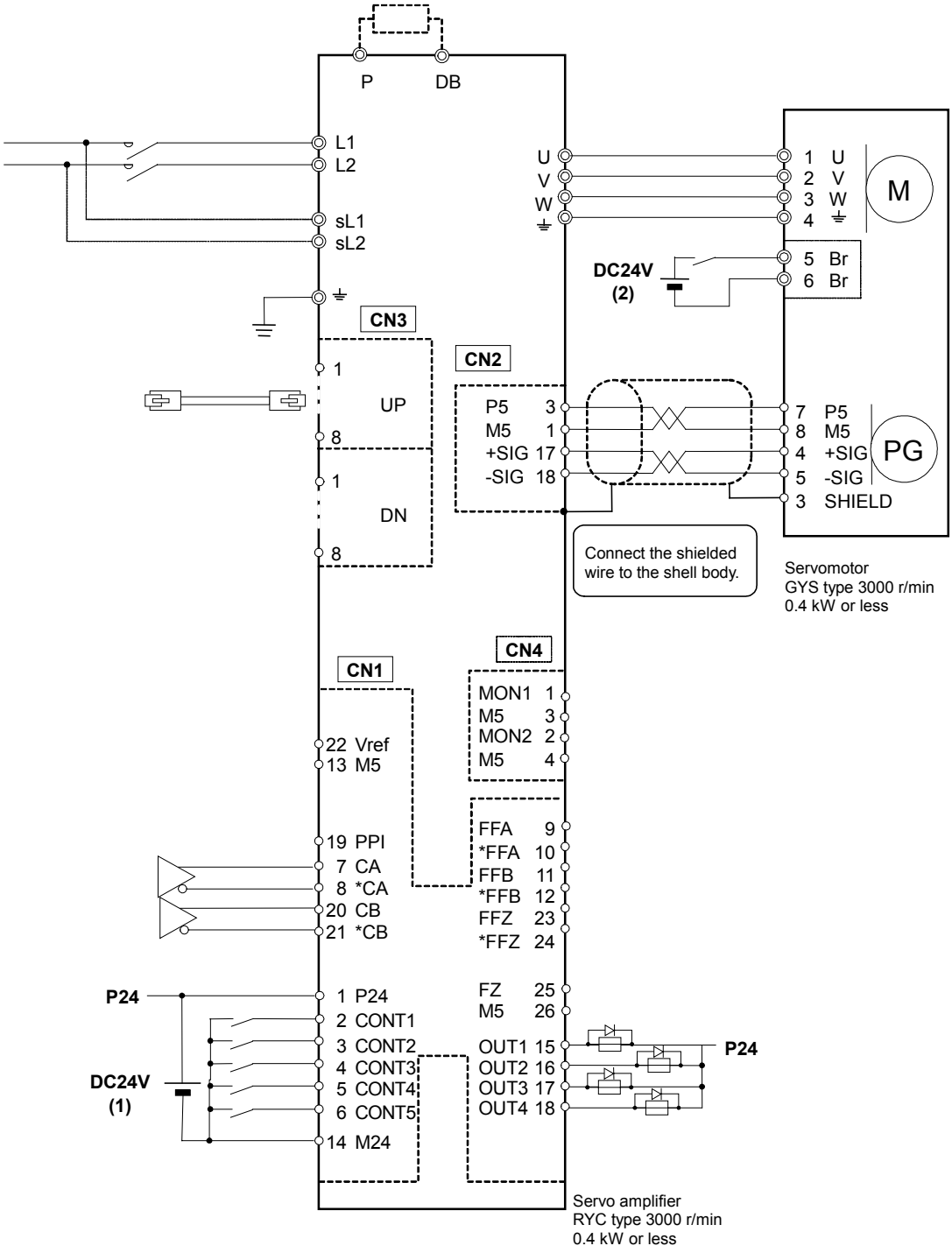
• The control power input terminal (sL1, sL2) is connected to perform parameter editing while the motor power is shut off. The servo amplifier is only operated with the motor power supply.

• Do not use the 24VDC power for both sequence input/output and the brake.
When the brake is released, the voltage may suddenly increase.
Also use a surge absorber.

(1) 3000 r/m series 0.05 kW - 0.4 kW

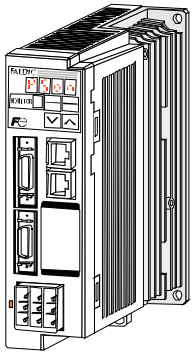
Input power supply : Single phase 200 - 230V

Motor power wiring : Connector

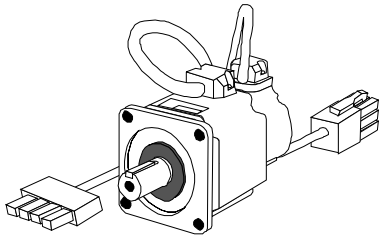


■ RYC500D3-VVT2 (0.05kW) /RYC101D3-VVT2 (0.1kW) /RYC201D3-VVT2 (0.2kW) /RYC401D3-VVT2 (0.4kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

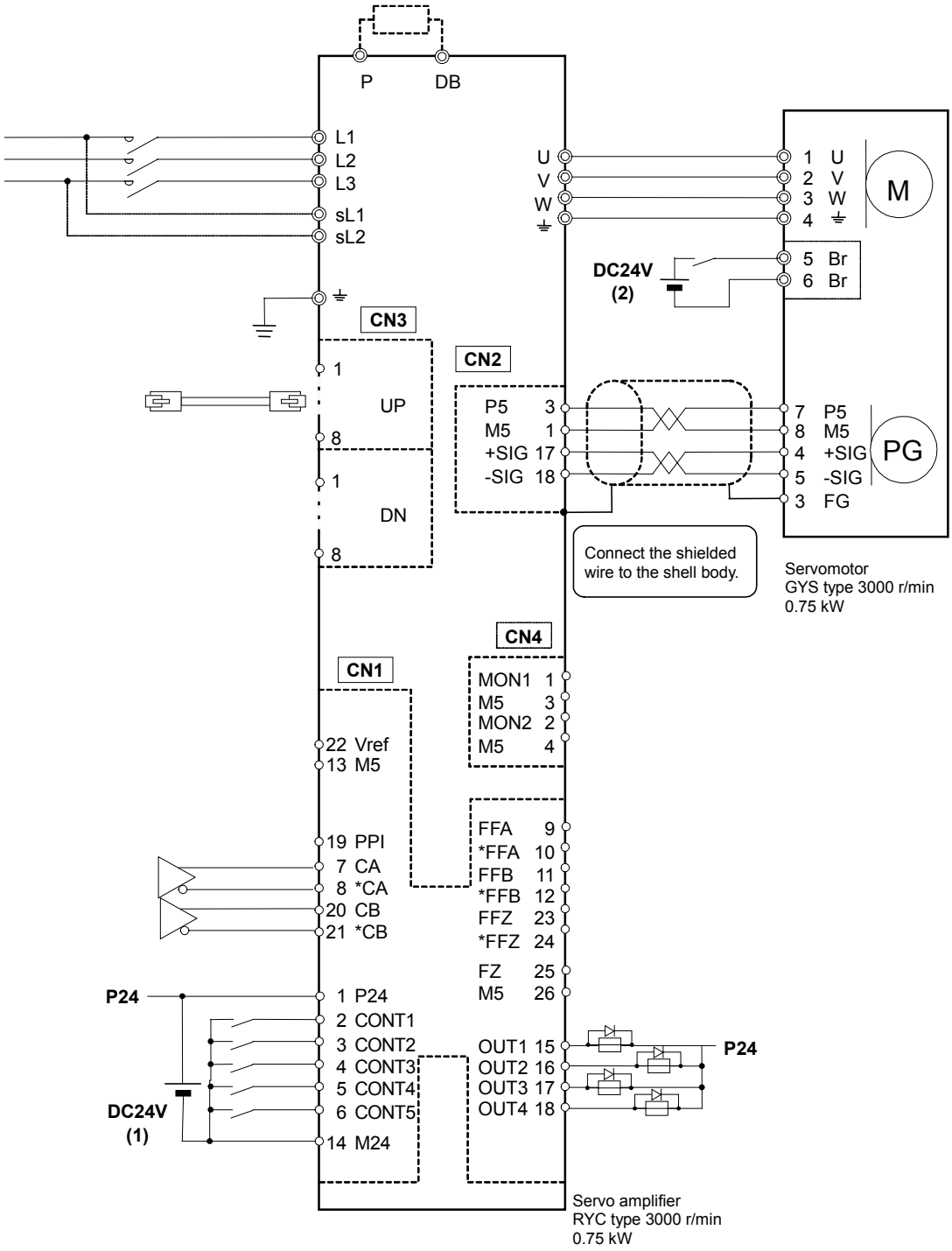
Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-D
Motor power cable (5 m)	Without brake	WSC-M04P05-B
	With brake (*1)	WSC-M06P05-B

* 1) Prepare wires for the brake separately.

(2) 3000 r/m series 0.75 kW

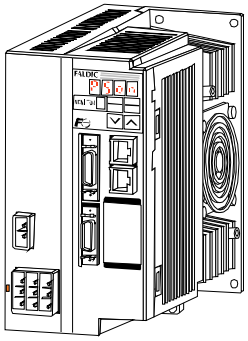
Input power supply : Single phase 200 - 230V or 3 phase 200 - 230V

Motor power wiring : Connector

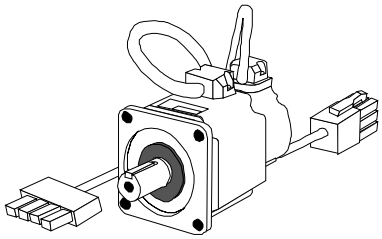


■ RYC751D3-VVT2 (0.75kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

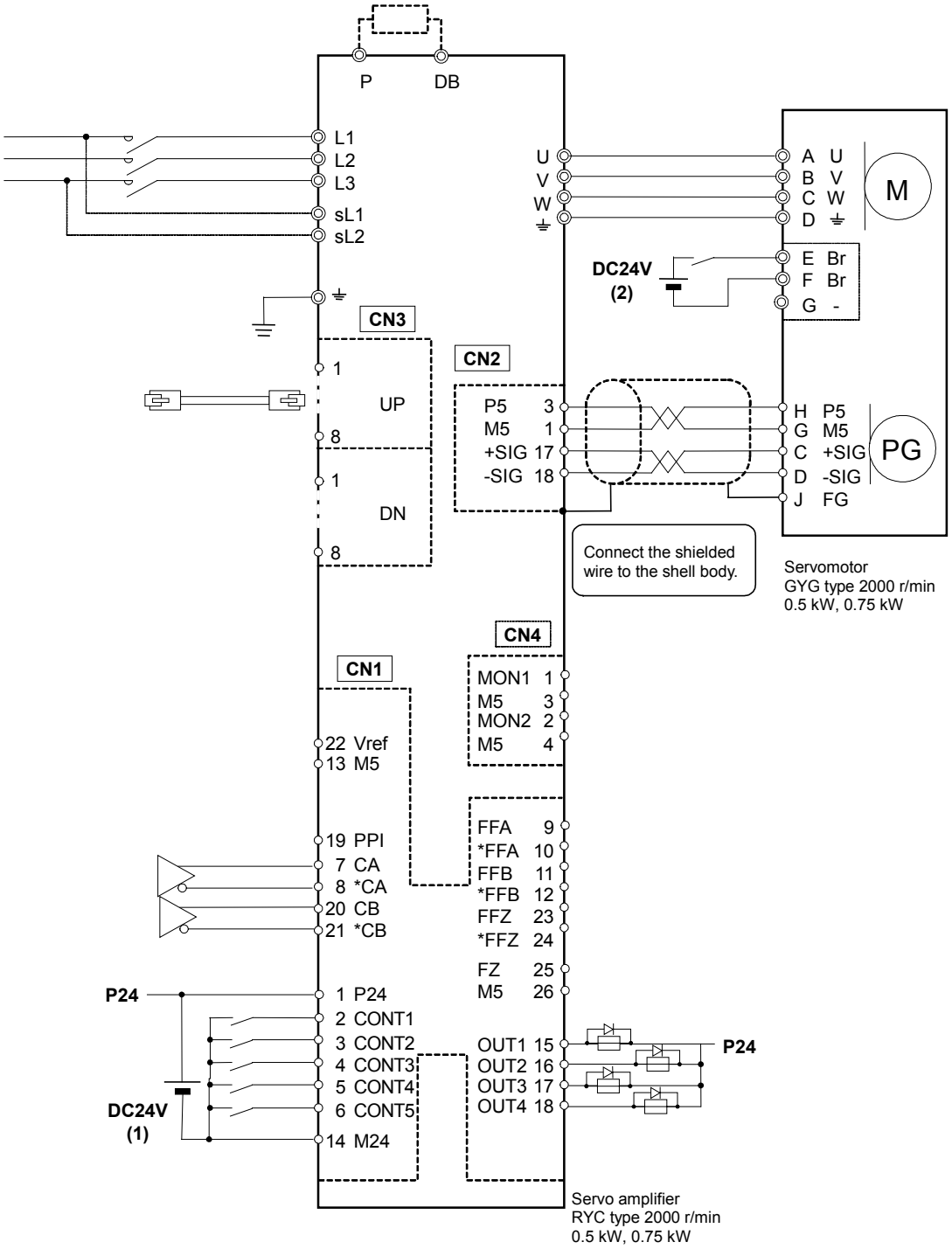
Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-D
Motor power cable (5 m)	Without brake	WSC-M04P05-B
	With brake (*1)	WSC-M06P05-B

* 1) Prepare wires for the brake separately.

(3) 2000 r/m series 0.5 kW - 0.75 kW

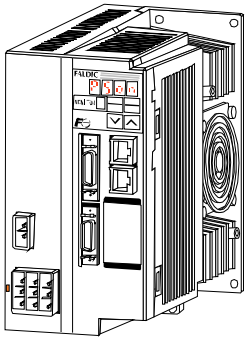
Input power supply : Single phase 200 - 230V or 3 phase 200 - 230V

Motor power wiring : Connector

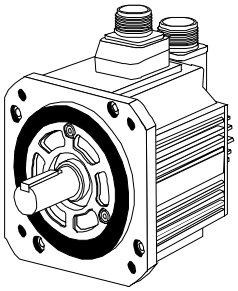


■ RYC501C3-VVT2 (0.5kW) /RYC751C3-VVT2 (0.75kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

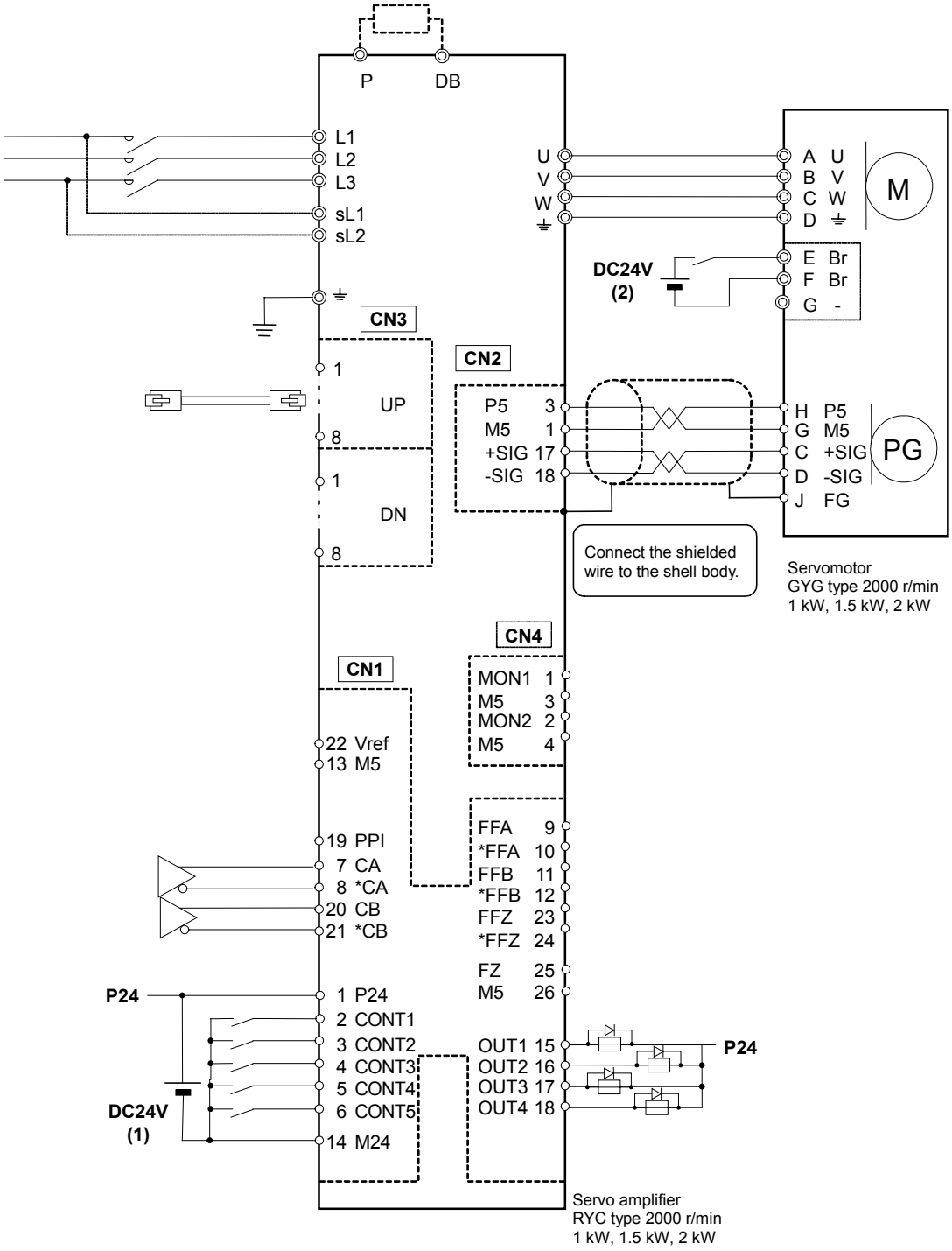
Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	WSC-M04P05-WD Connector kit : WSK-M04P-CA
	With brake (*1)	WSC-M04P05-WD Connector kit : WSK-M06P-CA

* 1) Prepare wires for the brake separately.

(4) 2000 r/m series 1 kW - 2 kW

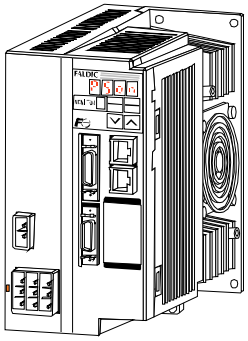
Input power supply : 3 phase 200 - 230V

Motor power wiring : Connector (1 kW), terminal block (1.5 kW, 2 kW)

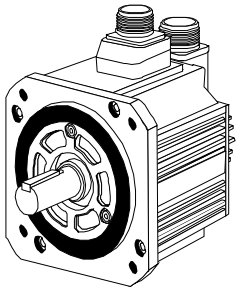


■ RYC102C3-VVT2 (1kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



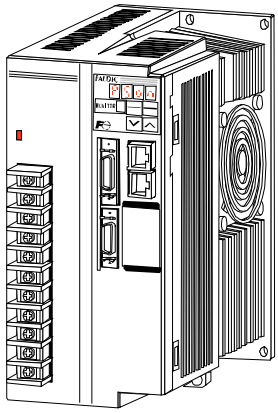
• Optional cable

Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	WSC-M04P05-WD Connector kit : WSK-M04P-CA
	With brake (*1)	WSC-M04P05-WD Connector kit : WSK-M06P-CA

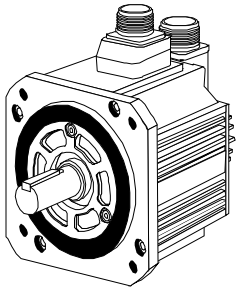
*1) Prepare wires for the brake separately.

■ RYC152C3-VVT2 (1.5kW) /RYC202C3-VVT2 (2kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

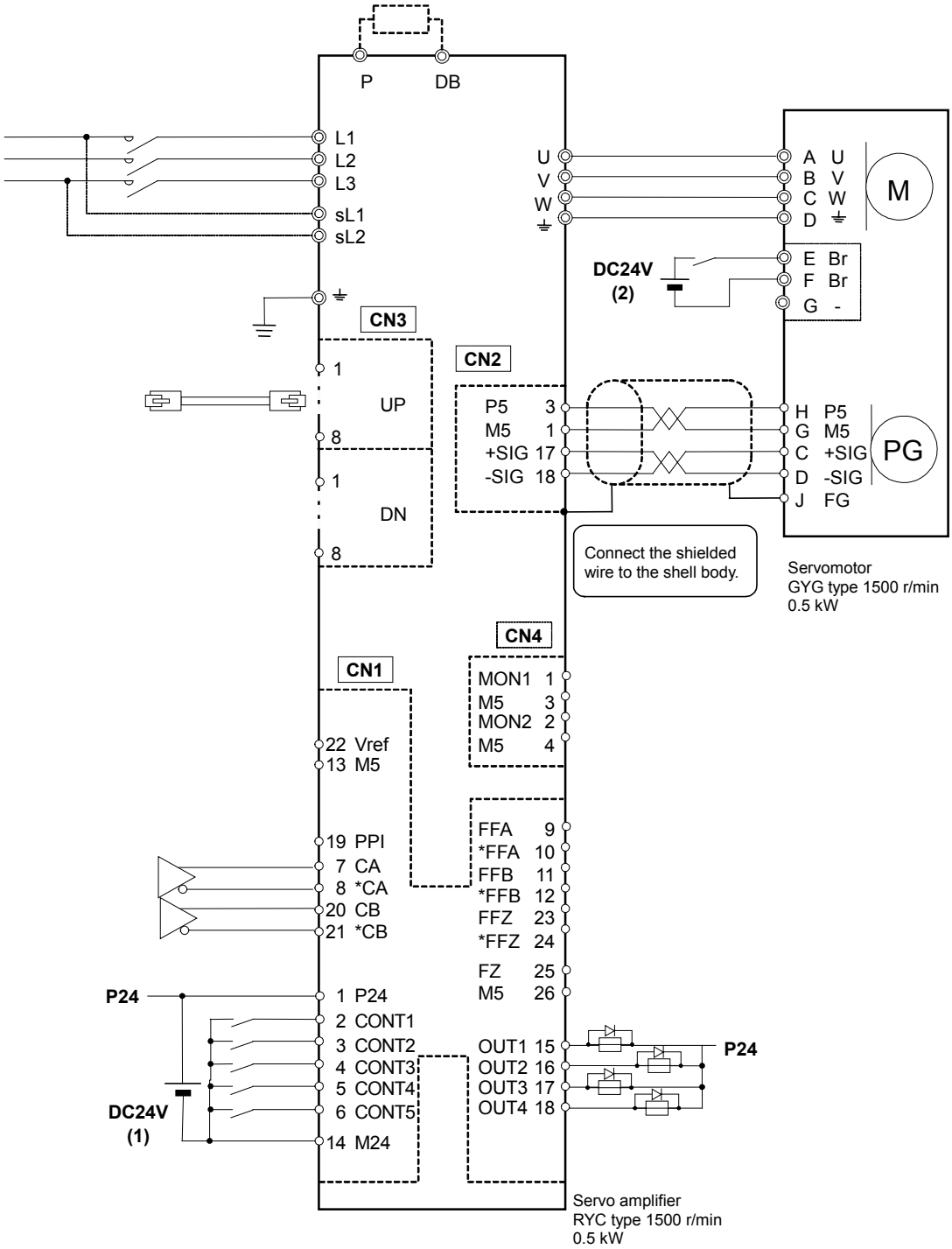
Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		(Terminal block: M4)
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	- Connector kit : WSK-M04P-CA
	With brake (*1)	- Connector kit : WSK-M06P-CA

* 1) Prepare wires for the brake separately.

(5) 1500 r/m series 0.5 kW

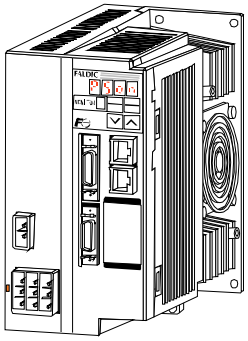
Input power supply : Single phase 200 - 230V or 3 phase 200 - 230V

Motor power wiring : Connector

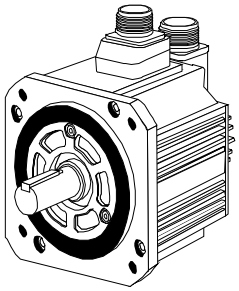


■ RYC501B3-VVT2 (0.5kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

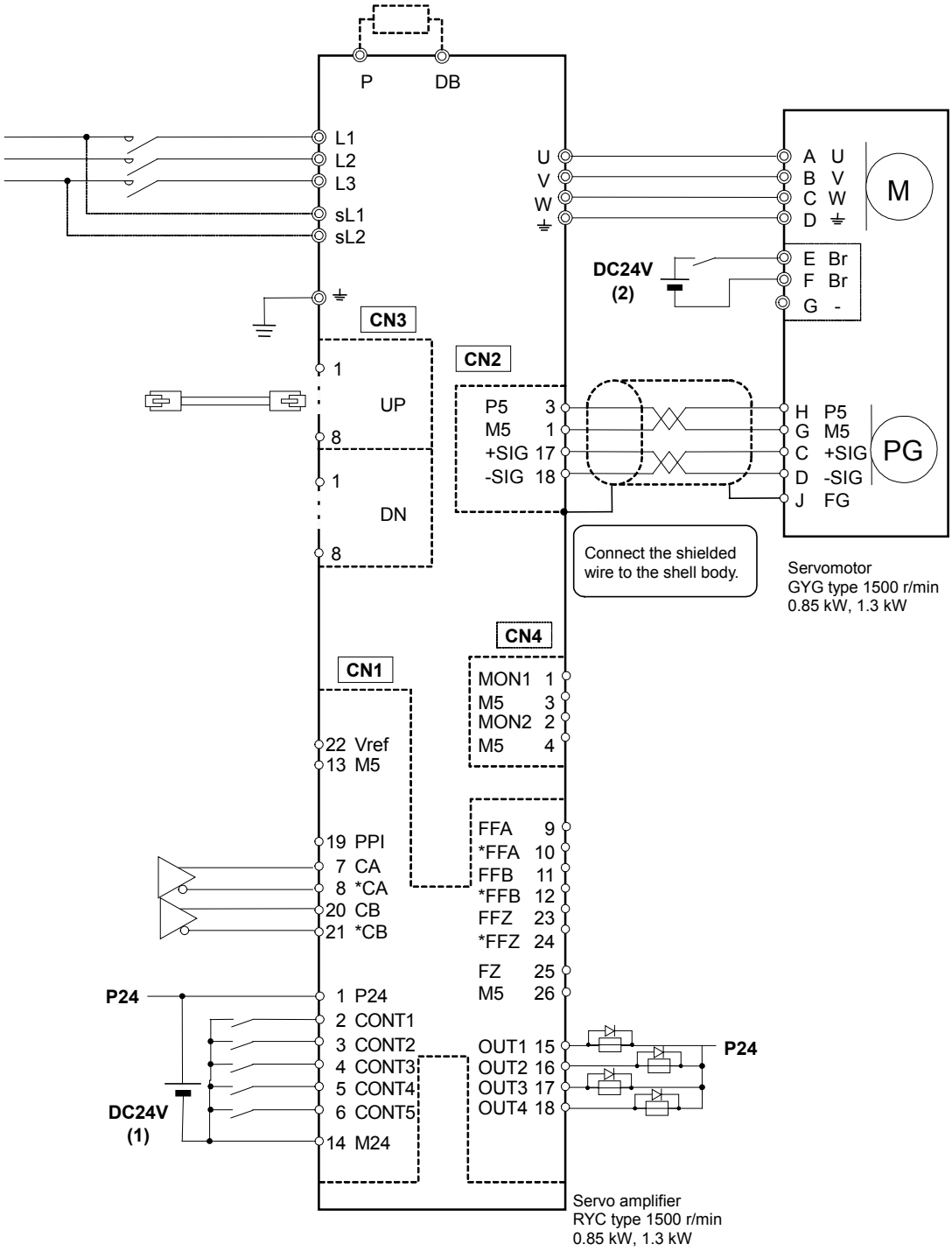
Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	WSC-M04P05-WD Connector kit : WSK-M04P-CA
	With brake (*1)	WSC-M04P05-WD Connector kit : WSK-M06P-CA

* 1) Prepare wires for the brake separately.

(5) 1500 r/m series 0.85 kW - 1.3 kW

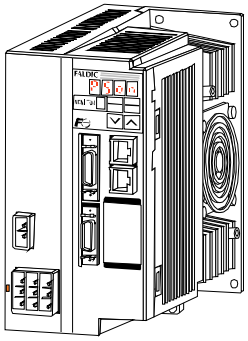
Input power supply : Single phase 200 - 230V

Motor power wiring : Connector (0.85 kW), terminal block (1.3 kW)

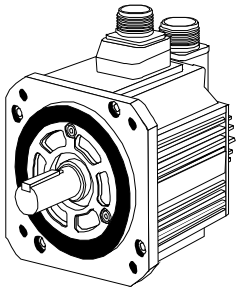


■ RYC851B3-VVT2 (0.85kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



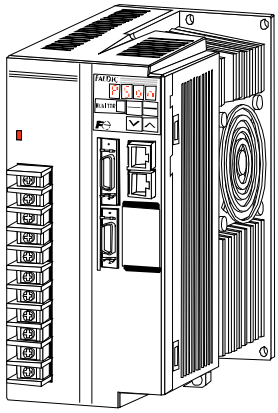
• Optional cable

Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		WSC-S03P03-B
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	WSC-M04P05-WD Connector kit : WSK-M04P-CA
	With brake (*1)	WSC-M04P05-WD Connector kit : WSK-M06P-CA

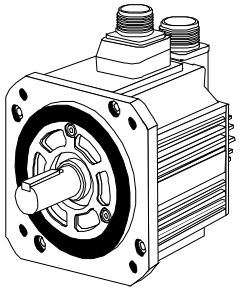
*1) Prepare wires for the brake separately.

■ RYC132B3-VVT2 (1.3kW)

• Example of servo amplifier appearance



• Example of servomotor appearance



• Optional cable

Description		Type
Sequence input/output cable		WSC-D26P03
Power wiring cable		(Terminal block: M4)
Encoder cable (5 m)		WSC-P06P05-CD
Motor power cable (5 m)	Without brake	- Connector kit : WSK-M04P-CA
	With brake (*1)	- Connector kit : WSK-M06P-CA

*1) Prepare wires for the brake separately.

-MEMO-

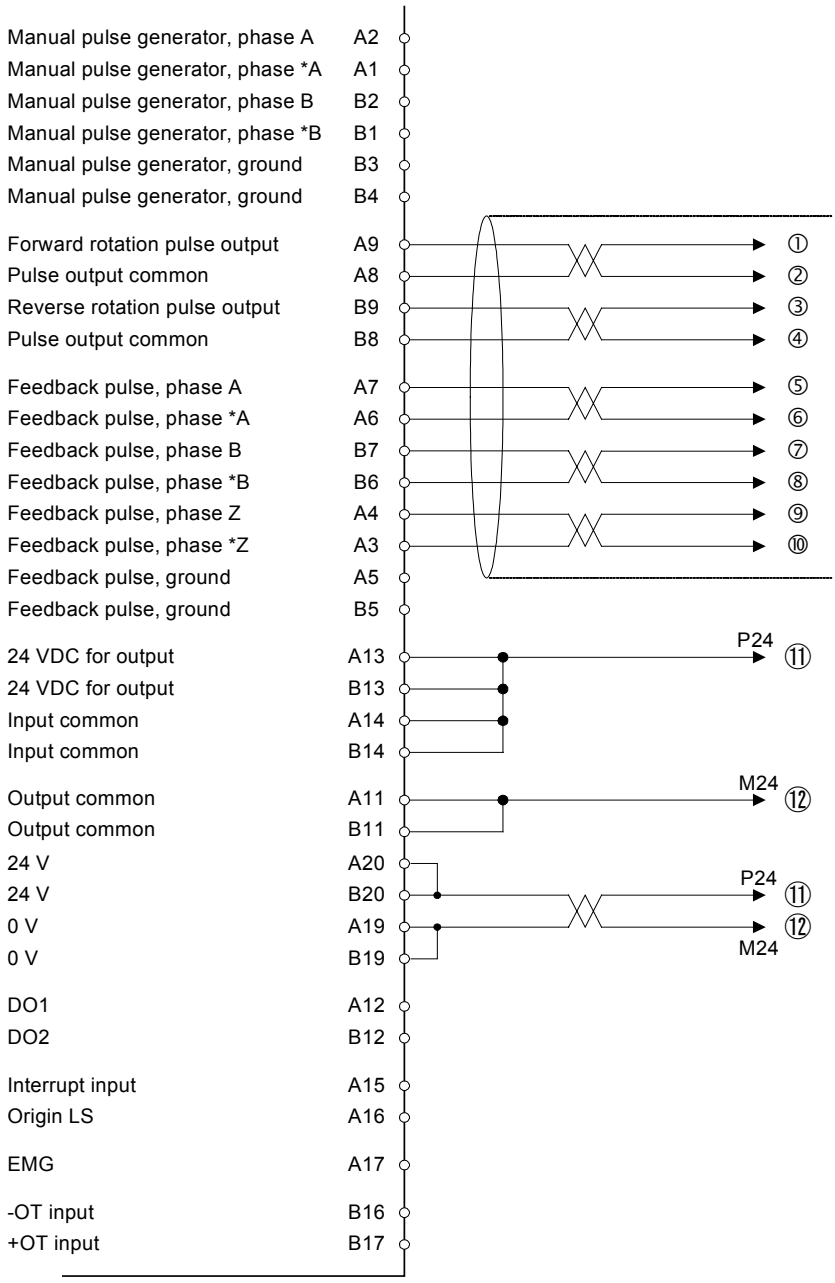
3.6 Connection examples

Examples of connections to each device are described.
For products not specified in this manual, be sure to refer to the operation manual or user's manual of the corresponding equipment. The connection diagrams shown in this chapter are for reference only.

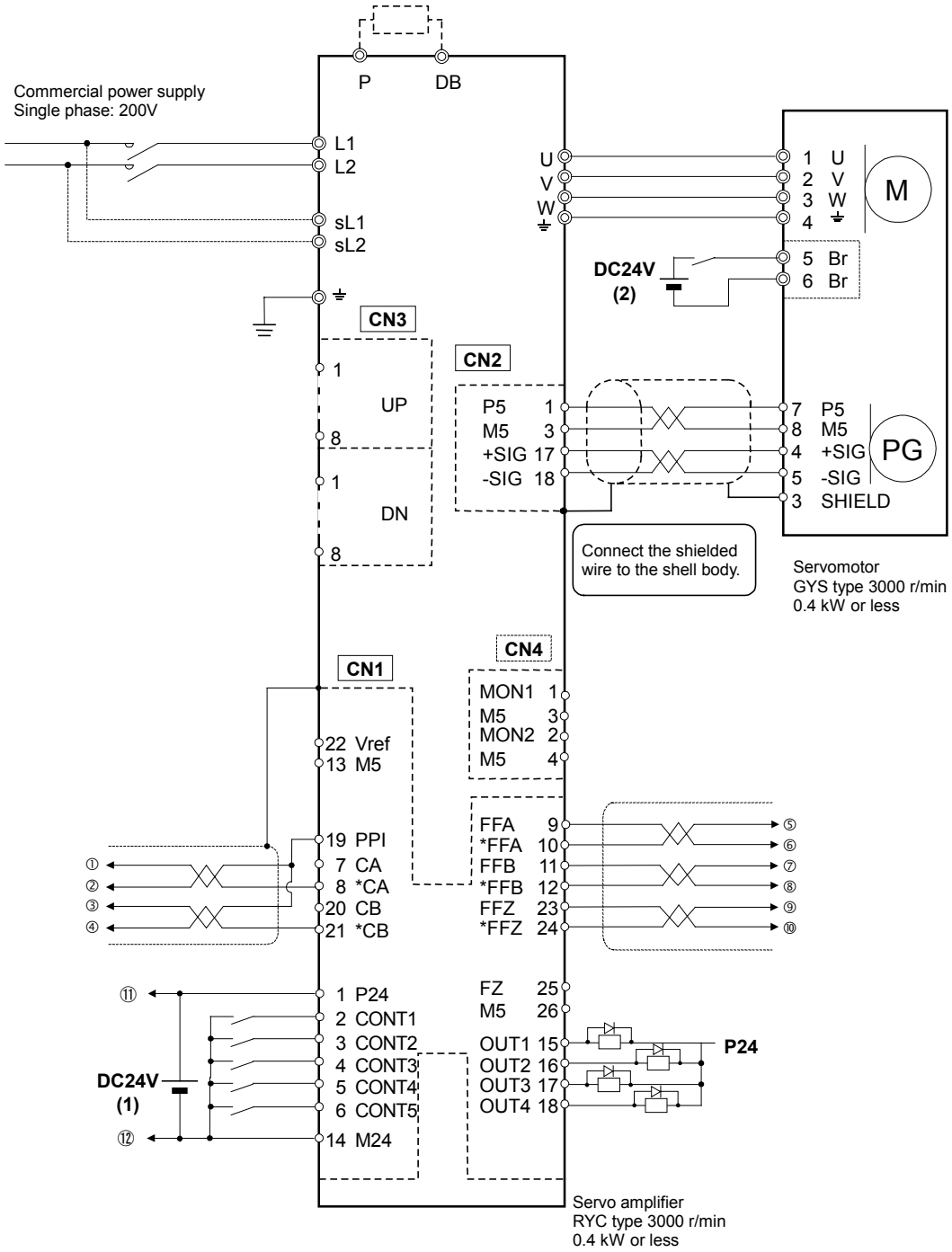
- Positioning module (NP1F-MP2)
- Positioning unit (QD75D type)
- Position control unit (NC113)

■ Positioning module (NP1F-MP2)

Example of connection with MICREX-SX series pulse-string output two-axis positioning module.
The control type is semi-closed loop with 500kHz maximum input frequency.
For the programmable logic controller, refer to the operation manual or user's manual.

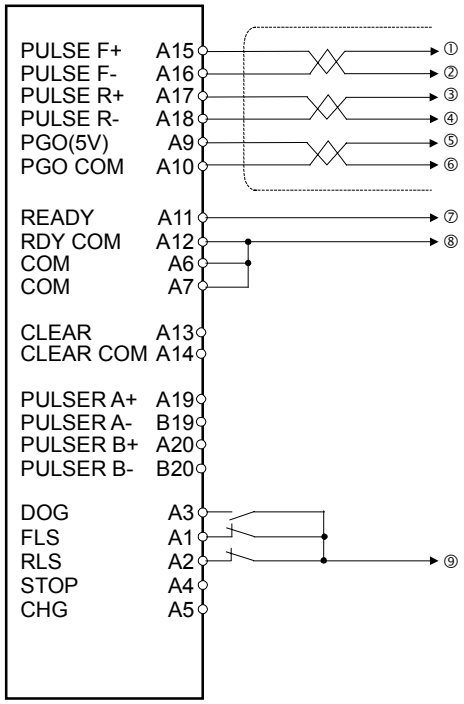


Pulse train output positioning module (2-axis specification)
[NP1F-MP2]


Commercial power supply
Single phase: 200V
P
DB
L1
L2
sL1
sL2
U
V
W
1 U
2 V
3 W
4
M
5 Br
6 Br
DC24V
(2)
CN3
1
UP
8
1
DN
8
CN2
P5 1
M5 3
+SIG 17
-SIG 18
7 P5
8 M5
4 +SIG
5 -SIG
3 SHIELD
PG
Connect the shielded wire to the shell body.
Servomotor
GYS type 3000 r/min
0.4 kW or less
CN1
CN4
MON1 1
M5 3
MON2 2
M5 4
22 Vref
13 M5
19 PPI
7 CA
8 *CA
20 CB
21 *CB
FFA 9
*FFA 10
FFB 11
*FFB 12
FFZ 23
*FFZ 24
⑤
⑥
⑦
⑧
⑨
⑩
①
②
③
④
⑪
⑫
1 P24
2 CONT1
3 CONT2
4 CONT3
5 CONT4
6 CONT5
14 M24
DC24V
(1)
FZ 25
M5 26
OUT1 15
OUT2 16
OUT3 17
OUT4 18
P24
Servo amplifier
RYC type 3000 r/min
0.4 kW or less

■ Positioning unit (QD75 type)

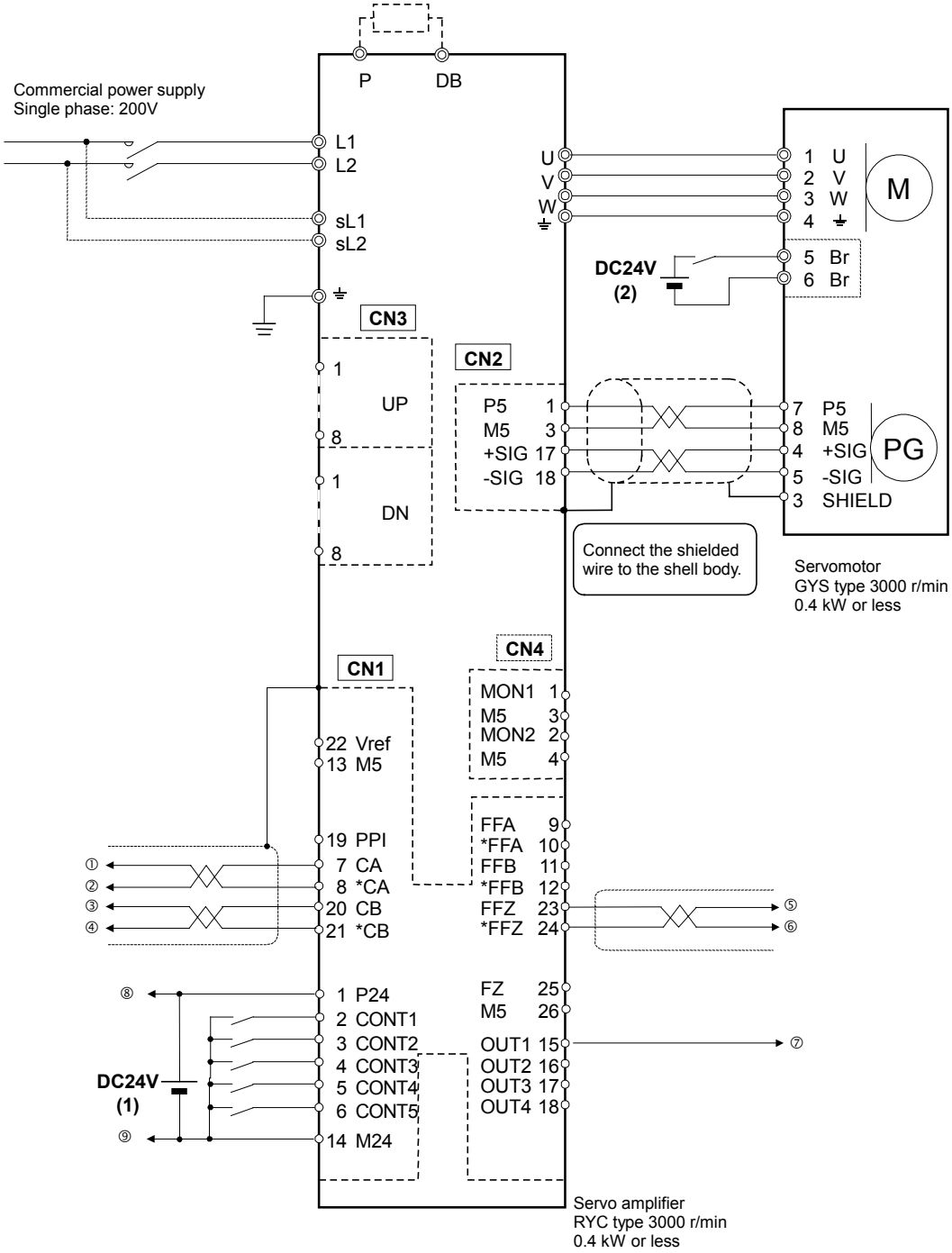
Example of connection with QD75D1 type positioning unit made by Mitsubishi Electric Co., Ltd.
Connections between the QD75D1 positioning unit and servo amplifier are shown.
For the programmable logic controller, refer to the operation manual or user's manual of the equipment.
The connection diagram shown in this chapter is only for reference.



*1: Connect the shielded wires to the connector shells of CN1 and CN2. The connector shells are connected to grounding wires.

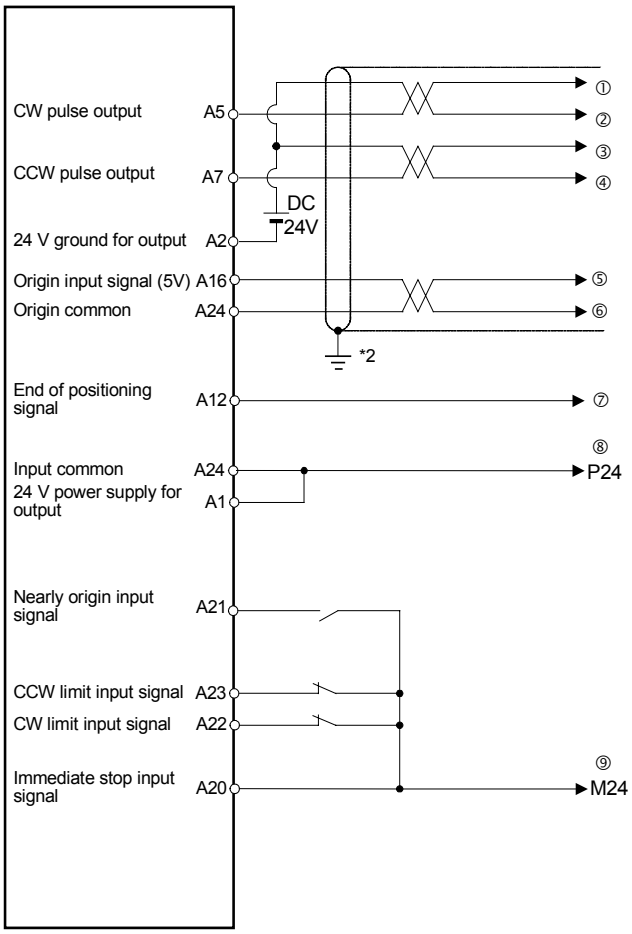
*2: Terminals vary depending on the capacity.

*3: The terminal symbol is different for 1.0 kW or more.

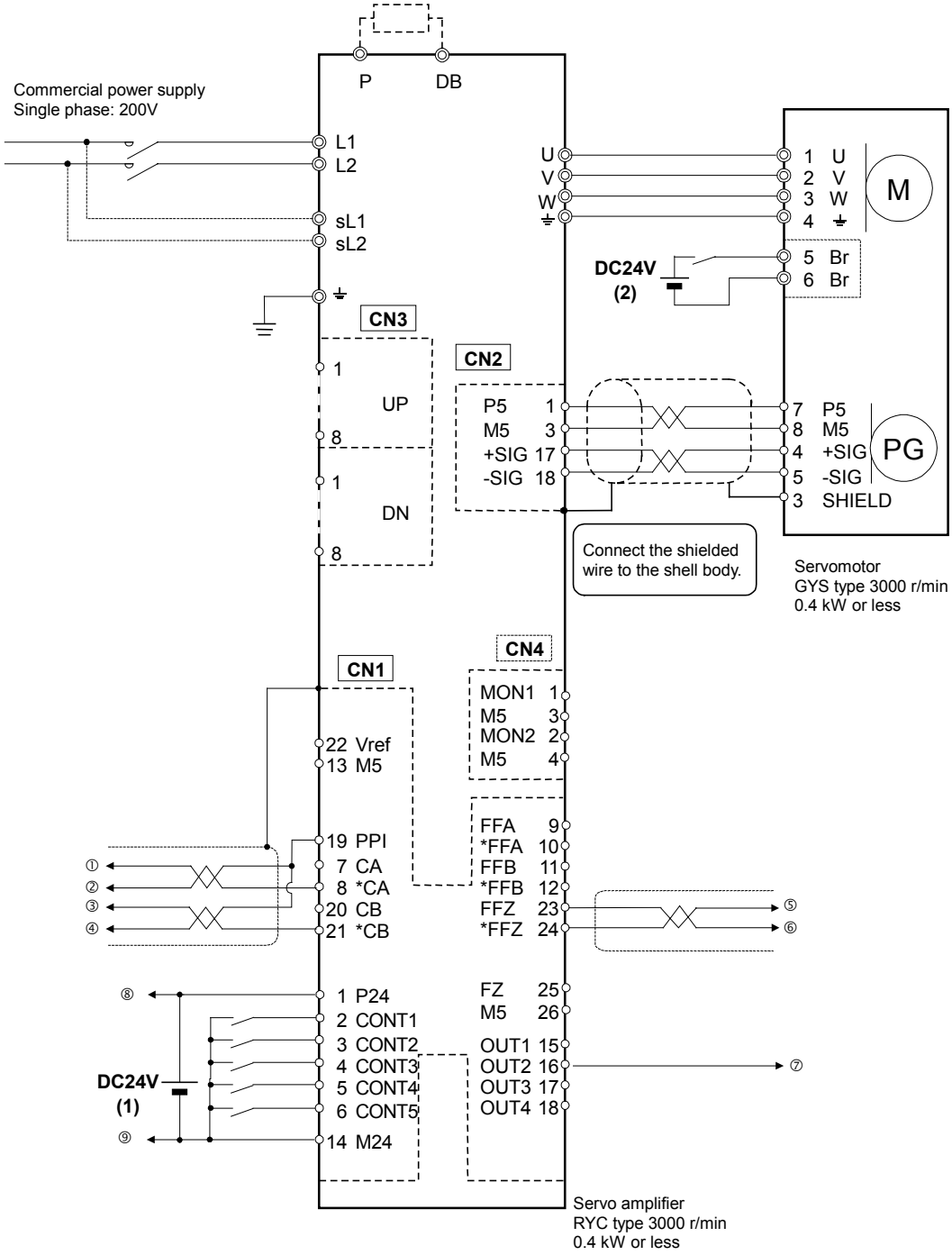

Commercial power supply
Single phase: 200V
P
DB
L1
L2
sL1
sL2
U
V
W
1 U
2 V
3 W
4
M
DC24V
(2)
5 Br
6 Br
CN3
CN2
1
UP
8
1
DN
8
P5 1
M5 3
+SIG 17
-SIG 18
7 P5
8 M5
4 +SIG
5 -SIG
3 SHIELD
PG
Connect the shielded wire to the shell body.
Servomotor
GYS type 3000 r/min
0.4 kW or less
CN1
CN4
MON1 1
M5 3
MON2 2
M5 4
22 Vref
13 M5
19 PPI
7 CA
8 *CA
20 CB
21 *CB
FFA 9
*FFA 10
FFB 11
*FFB 12
FFZ 23
*FFZ 24
⑤
⑥
①
②
③
④
⑧
1 P24
2 CONT1
3 CONT2
4 CONT3
5 CONT4
6 CONT5
14 M24
DC24V
(1)
⑨
FZ 25
M5 26
OUT1 15
OUT2 16
OUT3 17
OUT4 18
⑦
Servo amplifier
RYC type 3000 r/min
0.4 kW or less

■ Position control unit (C200HW-NC113 type)

Example of connection with C200HW-NC113 position control unit made by Omron Corp.
Only connections between the C200HW-NC113 position control unit and servo amplifier are shown.
For the programmable logic controller, refer to the operation manual or user's manual of the equipment.
The connection diagram shown in this chapter is only for reference.



*2 Ground the shielded wire at both ends. (Connect the wire to the connector shell for the amplifier and to the FG (grounding) for the pulse generator.)


Commercial power supply
Single phase: 200V
P
DB
L1
L2
sL1
sL2
U
V
W
1 U
2 V
3 W
4
M
DC24V
(2)
5 Br
6 Br
CN3
1
UP
8
1
DN
8
CN2
P5 1
M5 3
+SIG 17
-SIG 18
7 P5
8 M5
4 +SIG
5 -SIG
3 SHIELD
PG
Connect the shielded wire to the shell body.
Servomotor
GYS type 3000 r/min
0.4 kW or less
CN4
CN1
MON1 1
M5 3
MON2 2
M5 4
22 Vref
13 M5
FFA 9
*FFA 10
FFB 11
*FFB 12
FFZ 23
*FFZ 24
19 PPI
7 CA
8 *CA
20 CB
21 *CB
①
②
③
④
⑤
⑥
⑧
1 P24
2 CONT1
3 CONT2
4 CONT3
5 CONT4
6 CONT5
14 M24
DC24V
(1)
⑨
FZ 25
M5 26
OUT1 15
OUT2 16
OUT3 17
OUT4 18
⑦
Servo amplifier
RYC type 3000 r/min
0.4 kW or less

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